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# Handbook of Occupational Health and Safety

3<sup>rd</sup>  
edition





✓<sub>2</sub> Treasury Board  
of Canada  
✓<sub>1</sub>

Conseil du Trésor  
du Canada

Government  
Publications

# Handbook of ✓<sub>3</sub> Occupational Health and Safety

3<sup>rd</sup>  
edition

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## FOREWORD

The provision and maintenance of working conditions and procedures which are conducive to the safety and good health of employees is an important responsibility in the management and operation of the Public Service of Canada.

Accordingly, occupational health and safety policies, standards, procedures and guides have been established by the Treasury Board, pursuant to Section 7 of the Financial Administration Act, for application to the Public Service departments and agencies that are defined in Part I of Schedule I of the Public Service Staff Relations Act. The policies and standards have been the subject of consultation through the National Joint Council. This handbook incorporates all such documents issued to date through Chapter 055 of the Treasury Board's Personnel Management Manual, which is the official source for the information contained herein.

The policies, standards, procedures and guides contained in this handbook are designed to provide appropriate levels of health and safety for Public Service employees. It is, therefore, an important responsibility of each department and agency to ensure effective application of these provisions, and a similar responsibility of each employee to follow the specified requirements and procedures.

Occupational Health and Safety Group  
Personnel Policy Branch



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## POLICIES





## OCCUPATIONAL SAFETY POLICY

### INTRODUCTION

1. Employment accidents adversely affect both the lives of employees and the efficiency of the enterprise. They cause injuries to personnel and damage to material and equipment, increase operating costs and interfere with operations and production, all of which negate the basic management objectives of an organization.
2. Accident prevention measures, appropriately designed and implemented as an integral part of the management system and work operations are, therefore, an important and essential element of efficient management. Effectively administered, such measures will minimize the incidence of work injuries, lower operating costs and contribute to the maximum utilization of human and material resources.
3. The provision of a safe working environment and the prevention of accidents are therefore matters of vital importance to both employer and employee. Accordingly, the purpose of this subchapter is to outline a policy on Occupational Safety in the Public Service and to provide guidelines within which departments should develop and implement safety programs.

### POLICY

#### Summary

4. The provision and maintenance of working conditions and procedures which are conducive to the health and safety of employees is a prime requisite in the operation of the Public Service of Canada, and, to this end, departments and agencies are responsible for implementing and maintaining safety programs appropriate to organizational, occupational and employee needs.

### APPLICATION

5. This policy applies to all departments and other portions of the Public Service of Canada as defined in Part I of Schedule I of the Public Service Staff Relations Act.

### OBJECTIVE

6. The objective of this policy is to achieve safe and healthful working conditions and procedures for all employees and to prevent or reduce the risk of employment injury.

## IMPLEMENTATION

### Responsibilities

7. The Treasury Board is responsible for the development, establishment and publication of Public Service occupational health and safety standards, guides and procedures, and for evaluating the effectiveness and general application of this policy.
8. Each department and agency is responsible for
  - (1) the establishment and maintenance of an internal policy and program designed, as a minimum, to prevent employment injury and assure the continuing safety of employees at work;
  - (2) ensuring that active involvement by employees or their representatives is maintained at appropriate levels within the organization in regard to the aims and the administration of the safety program.
9. In support of this policy and program, Labour Canada, through the services of safety officers designated under the Canada Labour Code (Part IV), has been delegated responsibility for carrying out periodic safety inspections and accident investigations throughout the Public Service and, where unsafe operations or working conditions are noted, for reporting and providing advice and direction to departments concerning corrective measures. In this regard, the disposition and implementation of such directives shall be governed by the procedures attached as Annex A. Safety officers may also be called upon to investigate a situation arising out of the provisions of paragraph 14, in which case the procedures attached as Annex C shall apply. It is also a function of Labour Canada to provide, upon request, technical advice and guidance in respect of accident prevention matters.

### Guidelines

10. The key elements of an effective departmental safety program are active management leadership, provision of a safe working environment, effective training and supervision of personnel and an involved and co-operative work force.
11. As in any other area of departmental activity, the safety program must be systematically planned, developed and actively maintained. It should be initiated and directed by management, incorporate meaningful participation by employees, and be organized and administered so that the accident prevention activities are integrated with the organization's normal operations.
12. In implementing this policy, therefore, each department and agency is to establish and maintain an effective program of accident prevention activities as an integral part of its operations that will achieve safe and healthful working conditions for all employees. To this end, and without

restricting departmental prerogatives, departments and agencies are responsible for the organization and maintenance of a formal safety program appropriate to the work activities, environment and risks involved and which incorporates, as a minimum, relevant policies, standards, guides and procedures issued by the Treasury Board, such program to encompass the following:

- (1) the development and publication of a statement of internal safety policy which includes specific and overall safety responsibilities and objectives to guide the operation of the program;
- (2) the provision and maintenance of safe working conditions and procedures, supported by an effective system of safety inspection of all operating equipment and facilities in the department;
- (3) the implementation and enforcement, through appropriate lines of delegation and authority, of Treasury Board and other applicable safety/health standards, codes and procedures;
- (4) the provision of measures for ensuring that accidents occurring within the department's jurisdiction are investigated, reported and remedial action taken according to the procedures and requirements specified for the Public Service, and that the appropriate internal statistical records are maintained;
- (5) the provision of appropriate information, instruction, training, supervision and direction throughout the organization in regard to accident prevention methods and practices, and individual safety responsibilities and accountability;
- (6) the provision of measures for ensuring that the safety performance of each member of management respecting those areas under his/her supervision is regularly evaluated relative to established safety objectives (Annex B);
- (7) the establishment of a system to provide regularly scheduled audits or reviews of the safety activity and work injury experience of all organizational segments of the department;
- (8) the provision of appropriate emergency medical aid arrangements and/or facilities based on the first aid requirements specified for the Public Service;
- (9) the assignment of adequate safety personnel according to the size, complexity and operating risks of the department;
- (10) the establishment of Management-Employee Safety Committees at appropriate organizational levels to assist in the administration of the safety program;

- (11) the provision of directives for ensuring that safety officers designated by Labour Canada are afforded entry to all premises and facilities for purposes of inspection and accident investigation pursuant to paragraph 9.

#### Employee Involvement

13. Each employee has the responsibility to know and observe all relevant safety rules and procedures and to co-operate with the employer in achieving the objectives of the safety program.
14. Where an employee has reasonable cause to believe that a particular work process or condition directly associated with the employee's duties poses an imminent danger to his or her safety or health, or that of another person, that employee may withdraw from the work process or condition which is believed to be dangerous, in accordance with the Procedures attached as Annex C. Any work condition or circumstance that is normally associated with an employee's specific occupation, duties, or place of work is excluded from this provision.
15. An employee shall not be penalized, discriminated against or suffer any loss of wages as a result of exercising the right to withdraw from work, providing the employee has complied with the conditions and procedures specified in Annex C.

#### EVALUATION

16. This safety policy and supporting program will be evaluated by Treasury Board at periodic intervals for selected departments and agencies as determined and advised in advance by the Treasury Board Secretariat.

#### Performance Criteria

17. The evaluation of the effectiveness of this policy and its implementation will be based on the following performance criteria:
  - (1) this safety policy, together with relevant standards, guides and procedures issued by Treasury Board, are adopted and used as minimum requirements by departments and agencies to formulate and maintain their accident prevention policy and programs;
  - (2) departmental policy and supporting safety measures, standards, procedures and guides are communicated to and are being applied at all operational levels, are appropriate to departmental operations, and are achieving an acceptable level of safe and healthful working conditions for all employees;
  - (3) departmental management, supervisory staffs and employees are, according to need, receiving training and instruction in accident prevention practices and methods;



- (4) safety performance is included as an appraisal factor in evaluating the overall performance of managers, where appropriate;
- (5) Management-Employee Safety Committees and/or other joint-consultation arrangements are established and are appropriate to departmental operations;
- (6) the departmental program is evaluated internally by management at regular intervals to establish the measure of program effectiveness and achievement, and to delineate matters requiring special attention.

#### Data and Information Required

- 18. To evaluate the extent to which the performance criteria have been met, the following departmental information and data will be required, and are to be supplied to the Treasury Board upon request:
  - (1) copies of current departmental safety organization charts, policy statements and major supporting directives, procedures, etc., issued in conjunction with the safety program and its associated activities and objectives;
  - (2) copies of principal implementation directives issued at regional or district level in support of the departmental safety policy and program;
  - (3) data relative to the safety training and education (including first aid courses) of managers, supervisors and other employees, including the number and type of internal and external courses utilized, and the number of departmental participants;
  - (4) information respecting the provision and scope of formal Safety Committees, or other safety consultation arrangements;
  - (5) work injury data according to the minimum requirements specified in the Public Service Management Procedures respecting the Investigation, Recording and Reporting of Work Accidents and Injuries;
  - (6) copies of departmental or other internal safety program evaluation reports, where available.
- 19. Other relevant information or employment injury data prepared for the Treasury Board Secretariat through arrangements with Labour Canada may also be considered in the evaluation.

#### OTHER AUTHORITIES

- 20. In implementing this policy, departments and agencies are reminded that certain other organizations, in addition to the Treasury Board, have a statutory responsibility for standards or regulations affecting the health and safety of persons employed in the Public Service. In this regard, the following, in particular, should be noted:

- (1) The Office of the Dominion Fire Commissioner has authority respecting matters of fire prevention and protection, including the provision of fire prevention standards and procedures, for all property as defined in the Federal Government Property Fire Prevention Regulations.
- (2) Safety Regulations made pursuant to the Atomic Energy Control Act shall, where applicable, take precedence over those issued by the Treasury Board.
- (3) Transport Canada Safety Regulations made pursuant to the Canada Shipping Act shall, in the event of conflict with Treasury Board health and safety standards, take precedence over the latter.

#### INQUIRIES

21. Inquiries on matters related to this policy should be directed to:

Occupational Health and Safety Group,  
General Personnel Management Division,  
Personnel Policy Branch,  
Treasury Board Secr tariat.  
Ottawa, Ontario  
K1A 0R5

## ANNEX A

### PROCEDURES FOR IMPLEMENTING SAFETY DIRECTIVES OF LABOUR CANADA SAFETY OFFICERS

1. Safety officers designated by Labour Canada are authorized by the Treasury Board to conduct safety inspections and investigations throughout the Public Service and, where unsafe operations or working conditions are noted, to report and provide direction to departments and agencies respecting corrective measures. The disposition of such reports and directives shall be governed by the following procedures and requirements.

#### General Procedures

2. The safety officer's reports and/or directives shall be provided to the responsible local departmental official in written form.
3. Departments and agencies shall comply with such directives as soon as possible after they are received, or within a time limit, if so specified.
4. The responsible departmental official shall notify the Regional Director of Labour Canada of the date of implementation of each separate directive, and also of the reasons for any undue delay in the implementation of a directive, including the interim action being taken. The Regional Director may, at his discretion, vary or rescind a directive.
5. Where a directive has not been complied with and, in the opinion of the Regional Director, no satisfactory explanation has been provided, Labour Canada may refer the matter to the Personnel Policy Branch of the Treasury Board Secretariat for such action as the latter deems necessary.
6. If a department or agency considers that compliance with a safety officer's directive is not practicable or feasible, the Labour Canada Regional Director should be consulted, and, if the matter is not resolved, the department or agency may appeal the directive to the Personnel Policy Branch of the Treasury Board Secretariat. Following review, the Treasury Board shall determine the disposition of the matter.

#### Procedures in the Case of Imminent Danger

7. Where, in the opinion of a safety officer, a situation poses imminent danger to the safety or health of an employee, the department may be directed to take immediate action to rectify or remove the hazard or imminent danger. If the imminent danger cannot otherwise be guarded or protected against immediately, the safety officer may also order the suspension of the use of the facilities or the operations related to the imminent danger until the condition has been rectified.

8. In such cases, the safety officer shall discuss the matter with the manager in charge of the operation and if immediate action cannot be taken to remove the danger to an extent satisfactory to the safety officer, and if, in his opinion, there is no other alternative, he will issue a written suspension order directed to the manager. Upon receipt of the suspension order, the manager shall take action to immediately discontinue the operation or use of the facility in question until the condition has been rectified in compliance with the safety officer's directive.
9. Where a suspension order has been issued, it shall be the responsibility of Labour Canada to immediately notify the Personnel Policy Branch of the Treasury Board Secretariat and the Deputy Head of the department or agency concerned of the suspension order.
10. If the department or agency considers that a suspension order is not warranted, it must comply with the order, but may request the Labour Canada Regional Director to review the matter, and if not resolved, may appeal to the Personnel Policy Branch of the Treasury Board Secretariat to have the order rescinded. Following review, the Treasury Board will determine the disposition of the matter.

## ANNEX B

### SAFETY RESPONSIBILITIES - MANAGERS AND SUPERVISORS

#### INTRODUCTION

1. The Public Service Occupational Safety Policy outlines a requirement for departments and agencies to develop and publish statements of internal safety policy which include specific and general safety responsibilities. While it is expected that this requirement will result in the broad identification of program responsibilities, it will also be necessary to assign a degree of direct safety responsibility to individual managers and supervisors. As the effectiveness of safety programs is directly related to the leadership and participation of management and supervisory personnel, it is important that there be an awareness of individual responsibilities and accountability in this regard.

#### DEVELOPMENT

2. The most appropriate time to formally consider the identification of occupational safety and health responsibilities of managers and supervisors is during the initial assignment of duties and responsibilities in a position, or at the time of periodic review of job content. As the position description is the basic document to describe the work performed, it must accurately reflect all related functions. Accordingly, the extent of safety responsibility can be determined by a careful analysis of the work in relation to the inherent duties and responsibilities of a position.

#### IMPLEMENTATION

3. Departments and agencies are required, therefore, to identify positions which require specific delineation of ongoing safety and health program responsibilities and, notwithstanding any lack of reference in classification standards, to include appropriate statements of such responsibility in the applicable position descriptions.



## ANNEX C

### PROCEDURES GOVERNING WITHDRAWAL FROM WORK IN THE EVENT OF IMMINENT DANGER

#### Imminent Danger

1. For purposes of these Procedures, "imminent danger" is defined as constituting any work hazard or condition which could reasonably be expected to cause illness or injury to an employee at any time without warning.
2. Any work condition or circumstance that is normally associated with an employee's specific occupation, duties or place of work is excluded under these Procedures.

#### Withdrawal from Work

3. Where an employee has reasonable cause to believe that
  - (1) the use or operation of a machine, device, material or thing would constitute an imminent danger to his or her safety or health, or to another person, or
  - (2) a physical condition exists in the work place that would constitute an imminent danger to his or her own safety or health,that employee may withdraw from the particular work process or condition which is believed to be dangerous until the situation has been resolved in accordance with these Procedures.
4. In the event of such withdrawal, the employee shall immediately report the circumstances of the matter to his or her supervisor, or to the person in charge, and to the applicable employee representative, where available.
5. Upon being informed by an employee of withdrawal from work, the supervisor or person in charge, together with another person if desired, shall forthwith investigate the situation in the presence of the employee and, if so desired by the employee, another person or representative selected by the employee. Wherever possible, appropriate steps should be taken at this stage to resolve the situation to the satisfaction of all concerned.
6. No other employee shall be assigned to use or operate the machine, device, material or thing or that part of the work which is being investigated pending resolution of the situation.

### Continuing Withdrawal

7. Where the supervisor or person in charge disagrees that imminent danger exists, or takes action to correct the situation and the employee has reasonable cause to believe that the imminent danger which was the cause of the withdrawal from work still exists, the employee may continue to withdraw from the work process or condition but must forthwith renotify the supervisor or person in charge and the applicable employee representative, where available.
8. Where such employee continues to withdraw from work, the local responsible departmental official shall immediately notify the nearest Regional or District Director of Labour Canada, and shall inform the applicable employee representative of this. Labour Canada shall assign a safety officer to investigate the matter forthwith, and such investigation shall be carried out in the presence of the supervisor or person in charge, and the employee and his or her representative, where available. If the circumstances relating to the matter appear to have a bearing on employee health, the safety officer shall consult the appropriate Regional or Zone Director, Medical Services Branch, Health and Welfare Canada, who will provide such assistance as may be necessary.
9. Following the investigation, the safety officer, in conjunction, where applicable, with Medical Services Branch personnel, will render a decision as to whether or not an imminent danger condition exists, and shall forthwith advise the local departmental official and the employee of the decision in a written report. The departmental official shall, in turn, notify the applicable employee representative of the decision.
10. If imminent danger is confirmed, the imminent danger procedures contained in Annex A to the Public Service Occupational Safety Policy shall be applied.
11. Where the safety officer confirms that imminent danger exists, the employee may continue to withdraw from the work affected until the condition has been rectified in compliance with the safety officer's directive.
12. When the safety officer determines that imminent danger is not present, the employee no longer has the right under these procedures to continue to withdraw from work.

## ANNEX D

### PROCEDURES GOVERNING THE ORGANIZATION AND OPERATION OF JOINT SAFETY AND HEALTH COMMITTEES

1. Each department and agency shall develop, in consultation with bargaining agents, internal program directives and instructions governing the establishment and operation of a national joint safety and health committee and local joint safety and health committees, which will assist in the administration of the health and safety programs. Such departmental directive shall, subject to the provisions of collective agreements, incorporate all necessary detailed administrative instructions required to give effect, as a minimum, to the following requirements or principles:
  - (1) the establishment of a joint committee at the request of either party, at every location where its operation is appropriate and practicable, taking into account particularly the risk or hazard of the operations and the number of employees at a location;
  - (2) the detailed operating rules, terms of reference, functions and composition of such committees, including the provision for equal representation of management and bargaining agents where possible;
  - (3) the committee's role in accident investigation; concerning inspection of the workplace; in the formulation of recommendations to remove or lessen accident causes; in the promotion through educational means of the health and safety program; in the promotion of related research as required, and other activities related to the health and safety program;
  - (4) the conduct of committee meetings on a regular basis, or as requested by either party;
  - (5) the availability of all records, reports and documents required for the use and operation of the committee, and the distribution of records, minutes and notices of meetings among participants;
  - (6) the submission of committee reports and recommendations to the responsible local manager, and the latter's responsibility to inform the committee of the proposed disposition of each recommendation;
  - (7) the provision for review at a higher level of any matter which is not resolvable by a committee.
2. Where the use or formation of a joint safety and health committee as specified under this directive is deemed impracticable or unnecessary at a location, other operational and existing joint consultation arrangements may be used to fulfill the role of the joint safety and health committee.

## OCCUPATIONAL HEALTH POLICY

### INTRODUCTION

1. The value and importance of the good health of Public Service employees is recognized as a matter of primary importance by the Treasury Board. It is intended, therefore, through this Public Service Occupational Health Policy, to promote and provide for working environments and health services designed to maintain the good health and well-being of employees, and thereby minimize the incidence of work-related illnesses.
2. The Policy makes provision for a Public Service Health Program by authorizing the development and implementation of health standards, by providing appropriate levels of professional health services and facilities, and by outlining requirements concerning research, education and training in occupational health.
3. The Health Program will be essentially preventive, and it is neither its function nor purpose to interfere with or displace the services available through practising physicians and other recognized health services of the community.
4. The purpose of this Subchapter is to outline the details of the Public Service Occupational Health Policy, and to provide guidance and direction for the development and implementation of the occupational health program.

### OBJECTIVE

5. The objective of this policy is to provide appropriate levels of health services and facilities, and to achieve and maintain healthful working conditions in order to prevent or reduce the risk of occupational illness.

### POLICY

6. The provision of appropriate levels of health services, facilities and programs designed to sustain the good health of employees, and the maintenance of healthful working conditions, are accepted requisites and responsibilities in the management of the Public Service of Canada.

### APPLICATION

7. This policy applies to all departments and other portions of the Public Service of Canada as defined in Part I of Schedule I of the Public Service Staff Relations Act.

## IMPLEMENTATION

### Responsibilities

8. The Treasury Board is responsible for the development and promulgation of occupational health policies, standards, procedures and guides, and for evaluating the effectiveness and general application of the health policy and relevant programs.
9. Health and Welfare Canada is responsible for the organization, operation, administration and supervision of the Public Service Health Program, and for the research and provision of health data, information and advice to the Treasury Board.
10. Labour Canada, at the headquarters and regional level, will contribute cooperatively to the Program in a technical and advisory capacity, as required.
11. Departments and agencies are responsible for:
  - (1) ensuring that the planning and provision of work environments are conducive to the good health and well-being of employees;
  - (2) maintaining close and continuing liaison with Health and Welfare Canada Regional Medical Services Branch Offices in all aspects of health program administration; and
  - (3) promoting the active cooperation of employees and employee representatives in the local operation of the program.

### Guidelines

12. The operation, administration and supervision of the Health Program will be carried out by Health and Welfare Canada, principally through the regional offices of its Medical Services Branch. Accordingly, all professional Public Service health personnel will be established only under the control of Health and Welfare Canada. Program activities will encompass:
  - (1) the provision of advice and appropriate health counselling services for any special health activities, including those concerned with mental health, employee assistance (alcoholism) etc;
  - (2) the investigation and surveillance of occupational health factors, including physiological, psychological and sociological factors, which may affect the health of employees, and the provision of recommendations and advice to departments concerning corrective measures;
  - (3) the arrangement, co-ordination and conduct of physical examinations and health evaluation of employees, in accordance with Public Service standards;



- (4) the provision of advice to management in the adaptation and selection of work for employees with disabilities, and participation in the design of measures for rehabilitation and re-training of such employees;
  - (5) the provision of advice to management concerning the selection and use of personal protective equipment and clothing;
  - (6) the provision of advice to Treasury Board concerning the development and monitoring of standards, procedures and measures for the prevention of occupational illness;
  - (7) the provision to employees of health advice, health education material and training in health and hygiene, as required;
  - (8) the provision of emergency medical care as required;
  - (9) assistance and advice in the provision of first aid training, and in the verification of first aid services and supplies;
  - (10) the administration of authorized immunization or other special health/medical activities;
  - (11) the provision, in certain cases, of "on-the-job" medical care with the cooperation and consent of the employee's private physician;
  - (12) the compilation, review and interpretation of comprehensive employee health statistics and data;
  - (13) research in occupational health, including factors affecting morbidity and mortality rates among employees.
13. Health and Welfare Canada shall, through their Regional Medical Offices, establish and maintain close contact with all Public Service departments and agencies in matters concerning the operation and administration of the health program. Such contacts shall be established and maintained through the personnel administration offices of each department, and with safety and health committees and other committees or persons concerned with the occupational health and safety of Public Service employees.
  14. To perform their assigned functions efficiently, persons involved in the operation and administration of the program shall be afforded access to work places and be permitted to inspect these at appropriate intervals, in cooperation where necessary with other authorized inspectors. They may also monitor compliance with Treasury Board standards and directives concerning the health and safety of employees.
  15. Health personnel associated with the operation or administration of this program shall not be required to disclose or verify medical reasons for employee absence on grounds of health, and shall observe professional ethics concerning confidentiality and disclosure of all health-related information.

## EVALUATION

16. This health policy and program will be subject to evaluation by the Treasury Board one year after the date of promulgation and at future periodic intervals, as determined and advised in advance by the Treasury Board Secretariat.

### Performance Criteria

17. The criteria used to evaluate the effectiveness of this policy and its implementation will include the following:
  - (1) the principal requirements of the policy, together with all relevant standards, procedures and guides issued by Treasury Board, are applied in the formulation and maintenance of the health program;
  - (2) all required periodic and other health evaluations are being completed in accordance with the appropriate standard;
  - (3) all required occupational health hazard investigations and surveys are being completed promptly, and recommended corrective measures are being implemented without undue delay;
  - (4) departmental personnel are, according to need, receiving appropriate training and advice on matters pertaining to health and hygiene;
  - (5) comprehensive employee health statistics and data are being maintained and reviewed annually, and interpretation of such data is available on request.

### Data and Information Required

18. To evaluate the extent to which the Performance Criteria have been met, the following information and data will be required by Treasury Board upon request:
  - (1) copies of current supporting directives, procedures, standards, etc., issued by Health and Welfare Canada, in conjunction with the administration of the health program;
  - (2) data concerning the types and numbers of periodic and other health evaluations completed annually, and an interpretation of such data;
  - (3) data relative to the health training and education of employees, including the number of departmental participants;
  - (4) data concerning occupational health hazard surveys and investigations; and
  - (5) copies of any health program evaluation reports initiated by Health and Welfare Canada.

19. Other relevant information pertaining to the health program, prepared through arrangements between the Treasury Board and Health and Welfare Canada, may also be considered in the evaluation.

#### INQUIRIES

20. Inquiries on matters related to this policy should be directed to:

Occupational Health and Safety Group,  
General Personnel Management Division,  
Personnel Policy Branch,  
Treasury Board Secretariat,  
Ottawa, Ontario  
K1A 0R5

## ANNEX A

### THE EMPLOYEE ASSISTANCE PROGRAM

#### INTRODUCTION

1. The purpose of this annex is to provide direction to departments and agencies for the development of an internal Employee Assistance Program. This program is intended generally to provide confidential health assistance or advice to employees who may seek such help, or to those who may require it where work performance is adversely affected due to a health problem. However, due to the predominance of health/behavioural problems related to the misuse of alcohol and the specific techniques required for the identification and treatment of alcoholism, the principles and procedures outlined herein for application by departments, are directed mainly toward that illness.
2. The Employee Assistance Program is based on the accepted theory that the work environment can be effectively utilized for the early identification and motivation for assistance or treatment of employees troubled with health or behavioural problems.
3. Under this approach, the supervisor or manager is responsible, in the accepted role of work evaluator, not for diagnosis of a suspected health problem, but solely for the identification of the employee whose work performance is consistently impaired (refer to paragraph 16). This is the most effective method of identifying and reaching an employee who may need assistance due to a personal health problem.
4. Although this program is directed toward assisting employees with any particular health problem which results in impaired work performance, experience indicates that many of the underlying problems identified will be alcohol-related, although other health problems may also be identified.
5. The Employee Assistance approach encourages employees with an underlying alcohol problem to voluntarily seek, or otherwise receive help under the broad concept of the program. Thus, assistance and counselling can be provided earlier than in the case of the individual who is "coerced" into participating in an alcoholism rehabilitation program during the later and more "chronic" stages of this illness, when rehabilitation is most difficult.
6. The Employee Assistance concept is sufficiently flexible to be adapted to apply within a variety of operational methods and settings. Therefore, differences in departmental organization, operating methods and employment settings or tasks will have a bearing on the individual departmental approach to and related directives governing each program.

## OBJECTIVE

7. The objective of this program is to provide for the early identification, intervention and rehabilitation of employees with personal health/behavioural problems which are causing impaired or defective employee work performance, with particular emphasis on problems relating to the misuse of alcohol.

## POLICY

8. This program and subsequent departmental directives and procedures shall be developed and administered pursuant to the requirements of the Public Service Occupational Health Policy (TB 698074, June 12, 1970) which states that the government recognizes the value and importance of good health, and particularly the need to promote, foster and maintain the health and well-being of employees of the Public Service. That Policy also authorizes the Public Service Health Program, which provides appropriate levels of professional consultative services and facilities designed to maintain among employees a high degree of physical and mental well-being, and also provides, as required, advice for the improvement of the physical and mental adjustment of employees to their work.

## APPLICATION

9. These program directives apply to all Public Service departments and agencies, as defined in Part I of Schedule I of the Public Service Staff Relations Act.

## DEFINITIONS

10. Employee Assistance Program: A program designed to identify, counsel and assist or provide for the rehabilitation of employees with health/behavioural problems including particularly those problems related to the misuse of alcohol.
11. Program Administrator/Coordinator: An individual designated or appointed by a department or agency to direct or coordinate the Employee Assistance Program or an alcoholism program at the headquarters or regional level.
12. Personnel Assistance Counsellor: An individual qualified by experience and/or training in the techniques of early identification and intervention (particularly in respect of alcohol misuse) within the framework of an Employee Assistance Program. The counsellor (which may include an Occupational Health Nurse where available), is designated by a department or agency on a full-time or part-time basis

- (1) to interview employees;
- (2) to assess the problem and to determine the type of referral which may be necessary;

- (3) to arrange referrals for specialized employee assistance or health counselling, and for diagnostic and treatment services;
  - (4) to liaise closely with supervisors and Public Service health professionals, as available, during treatment phase and in "follow-up" activities designed to provide employee support during recovery.
13. Alcoholism: The chronic phase of a progressive illness characterized by repeated and excessive use of alcoholic beverages to an extent which interferes with an individual's health and interpersonal relations, and causes impaired or defective work performance.
  14. Alcohol Problem: The use of alcohol in a manner or to a degree which interferes with the individual's health, interpersonal relations, economic functioning or societal standing. In the context of an Employee Assistance Program, the problem may manifest itself through impairment or deterioration of job performance.
  15. Alcoholic: An individual who has been diagnosed by a health authority to have alcoholism. The term "recovered alcoholic" refers to the person whose disease has been arrested through abstinence.
  16. Impaired or Defective Work Performance: May be caused by a health/behavioural problem and may manifest itself in the form of poor workmanship, errors in judgement, misconduct, unsatisfactory or deteriorating personal relationships and, in many cases, a high rate of absenteeism.

#### RESPONSIBILITIES

17. The Treasury Board is responsible for the development and provision of standards, directives and guides governing the health of employees of the Public Service, and for evaluating the implementation and effectiveness of such directives or guides and the resultant programs.
18. Departments and agencies shall, in accordance with the provisions of this annex, be responsible for
  - (1) the development, establishment and maintenance of an active and comprehensive program for the early identification and referral for treatment of employees whose work performance is impaired as a consequence of the misuse of alcohol or another health/behavioral problem;
  - (2) the development and issuance of a detailed directive to guide all employees in the operation of and responsibilities respecting the program;
  - (3) ensuring that employee representatives are encouraged to participate in respect of the development and administration of the departmental program;

- (4) conducting a program of continuing education aimed at advising employees and supervisors on matters relating to the program.
19. As authorized in the Occupational Health Policy for the Public Service, Health and Welfare Canada will, through its Medical Services Branch and the Branch's regional offices and health units, provide advice and, upon request, arrange for consultative health services in respect to the operation of the program. Such health services are integral with and complementary to the existing Public Service health services facilities. In this regard, Health and Welfare Canada, through its Regional Medical Services facilities and health units, will be responsible for
- (1) maintaining close and cooperative relationships with departmental program administrators/coordinators and counsellors;
  - (2) providing or arranging for initial diagnosis or counselling in respect of alcoholism or other health problems;
  - (3) the provision of health advice and other related information as requested;
  - (4) ensuring that health unit and zone medical staff are trained in alcoholism counselling, rehabilitation and other techniques;
  - (5) acting as consultants to the recognized training authority (departmental or Public Service Commission), in respect of the approval of health/medical aspects in the design of supervisory training programs;
  - (6) establishing and maintaining liaison with community treatment, rehabilitation and recovery maintenance organizations;
  - (7) ensuring the maintenance of confidentiality of all medical information and records relating to this program.

#### IMPLEMENTATION

20. Departments and agencies are required to develop and publish individual internal directives and procedures governing a departmental Employee Assistance Program. While the scope or extent of the Departmental Program and the orientation of the related directives or procedures is at the discretion of each department, such program and related procedures shall, as a minimum, be based upon
- (1) the general principles and specific program requirements as outlined in this annex, with specific reference to paragraphs 20 to 36, inclusive; and
  - (2) the principles and requirements outlined in the Occupational Health Policy - Public Service of Canada (T.B. 698074, June 12, 1970) as amended or revised from time to time.

## Implementation - General Program Principles

21. The success of the program is highly dependent on the early identification of potential health/behavioural problems among employees, based on the recognition of continuously impaired work performance, or consistently poor or declining interpersonal work relationships.
22. The program requires the active involvement of, and the exercise of good judgement by all supervisory and managerial levels in the identification and documentation of impaired employee job performance which may be caused by a health/behavioural problem, and in motivating employees to cooperate in arrangements for referral for counselling, and where necessary, treatment.
23. Departments should encourage employees to voluntarily seek assistance for a health problem, and without prejudice to job security. However, where impaired or defective work performance has been documented by a supervisor/manager over a reasonable period of time, a mandatory referral will be arranged for counselling and, if necessary, for a health assessment by a health professional, designated by Health and Welfare Canada.
24. An employee will be subject to departmental action appropriate to the circumstances, which may lead to loss of job, by failure to cooperate with arrangements for a health evaluation or a prescribed rehabilitation program, or where, in the opinion of the responsible departmental official, the employee fails to show a satisfactory degree of improvement in faulty work performance.
25. Alcoholism is recognized as a treatable illness for which an employee, when following a rehabilitation program of a type approved by Health and Welfare Canada, is entitled to receive similar benefits and considerations as for other illnesses, and sick leave will be approved, subject to the availability of the employee's credits.
26. Apart from initial health evaluations and other emergency health services (including counselling), normally available to employees through Health and Welfare Canada, professional medical and health services available through the welfare and health agencies of the community shall be utilized for subsequent and ongoing treatment.
27. Employees who cooperate in the counselling, referral and rehabilitative aspects of the Employee Assistance Program, and whose work performance returns to a satisfactory status, do so without prejudice to job security and promotional opportunities. However, employees shall be made aware that they are required to cooperate and comply with all instructions and requirements relative to a recovery program and, at the same time, demonstrate that job performance and work requirements can be maintained at a level and to a degree satisfactory to the supervisor concerned. Such employees shall not be afforded special privileges or exemptions in respect of required compliance with routine working regulations, safety standards, or any other performance requirements.



28. Any information related to an individual case which is made available to the manager, the program coordinator, the counsellor or others directly involved in the case must be maintained in a completely confidential status. Medical records shall be treated as medically confidential in accordance with the confidentiality requirements outlined in the Occupational Health Policy for the Public Service of Canada.
29. Employee representatives should become involved and participate fully in the ongoing administration, educational and promotional aspects of the program.

#### Implementation - Specific Program Requirements

30. An individual shall be appointed or designated by a department or agency as program administrator/coordinator, to direct or coordinate the overall operation of the departmental program.
31. Arrangements shall be made by departments for the provision or availability of trained personnel assistance counsellors on a full or part-time basis, as required. The activities of such personnel are not intended to replace the recognized role of Public Service Health personnel, including the Occupational Health Nurse.
32. Supervisors and managers shall be appropriately informed of their individual responsibility to identify employees demonstrating consistently poor or deteriorating work performance, and to effect referral of such individuals to a personnel assistance counsellor.
33. Arrangements shall be made by departments through training or other communicative methods to educate and inform supervisors/managers concerning
  - (1) the concepts and methods of early health problem recognition solely through the identification of poor or deteriorating job performance;
  - (2) the details and techniques of constructive confrontation of the alcoholic, including proper methods concerning the effective and authoritative use, or threat of use of action or sanctions leading to loss of job;
  - (3) the ongoing supervisory techniques of "support during recovery" that are concerned with helping the recovered alcoholic to maintain sobriety status.
34. Ongoing arrangements shall be made through the appropriate Regional Medical Services Branch office of Health and Welfare Canada for the provision of medical/health assessments and diagnosis, and other information relative to the health/medical aspects of rehabilitation.
35. Contacts should be established (in liaison with Health and Welfare where possible), with local community organizations or resources which are concerned with information and education, advice, treatment and rehabilitation matters relative to the program.

36. Each department should plan and undertake a program of employee education and promotion, among employees, of its Employee Assistance Program. Such activities should incorporate an approach designed particularly to lessen the social stigma associated with alcoholism, and encourage affected employees to seek help voluntarily.

#### EVALUATION

37. This annex and the resultant programs of selected departments will be subject to evaluation two years from the date of promulgation, based on the following criteria:
- (1) The departmental Employee Assistance Program has been implemented and communicated to all required operational levels, is appropriate to the scope of its operations and complies with the general requirements and specific principles of this annex.
  - (2) The departmental program is identifying at an early stage, and providing for the rehabilitation of, employees with personal health/behavioural problems.
  - (3) Supervisors and managers are informed and trained in the methods and techniques to be used in the identification, referral and the managerial role in the rehabilitation of their employees under the departmental Employee Assistance Program.
  - (4) Departmental managers are satisfied with the service provided to them by Health and Welfare Canada as outlined under Paragraph 19.

#### Evaluation - Data Required

38. To evaluate the extent to which some of the performance criteria have been met, data relative to a specified period will be supplied by departments to the Treasury Board upon request, as follows:
- (1) A copy of the department's approved internal program directive.
  - (2) Confirmation of the appointment or assignment of a program administrator/coordinator, and an outline of the responsibilities and activities of that individual's position.
  - (3) The number of personnel assistance counsellors involved in the program at headquarters and, where applicable, regionally.
  - (4) The number and type of training seminars, meetings or other occasions in which supervisors were instructed in the details of supervisory responsibilities associated with the administration of the program.

- (5) The number of employees referred voluntarily and involuntarily for counselling, and the number thereof recovered and returned to work.
- (6) The number of employees with suspected health/behavioural problems who have been evaluated by Health and Welfare Canada under this program, and the number of alcoholics diagnosed and referred to a rehabilitation program.
- (7) The number of employees whose employment has been terminated as a direct result of alcohol or due to alcohol-related problems or illnesses.

## APPENDIX I

### CONFIDENTIALITY OF INFORMATION - EMPLOYEE ASSISTANCE PROGRAM (EAP)

1. All personal information records or data relative to an employee's involvement under an Employee Assistance Program shall be classified as CONFIDENTIAL. Should the current "CONFIDENTIAL" classification be amended by a future directive concerning the protection of information, the comparable classification shall be used.
2. Departmental personnel records or registries shall be used for the maintenance of information, correspondence, or reports concerning an employee's work performance, including absenteeism and disciplinary matters. Such files shall also be used to maintain copies of any formal notations or directions made to, or concerning, an employee, which formally require or specify conditions of work performance or conduct. Interpretations or reports of a non-medical nature concerning an employee's work capability or limitations may be placed on the employee personnel record.
3. Employee Assistance Counsellors/Advisors shall keep separately on their own EAP files certain other categories of confidential information which is generally of a type which should not be maintained on departmental personnel records or in registries. These files shall be classified CONFIDENTIAL, protected and handled in accordance with departmental security regulations and procedures, and only the Counsellor/Advisor shall have access to them. Generally, such files will contain information relative to an employee's involvement in an EAP, and include data such as records of referral to, or reports from, a health professional or rehabilitation or similar agency, and reports of discussions with the employee, or any other persons involved. Information on these files shall be released to the proper authority only upon written authorization by the employee involved.
4. All medical records or reports arising out of an employee health assessment by a health professional or clinic shall be maintained in a MEDICAL CONFIDENTIAL status under the responsibility of Health and Welfare Canada, in accordance with the Treasury Board Occupational Health Policy for the Public Service. Only non-medical interpretations or reports concerning an employee's work capability or limitations shall be forwarded to the appropriate departmental management or authority. Copies of these reports shall normally be maintained on the employee personnel record.
5. Where a supervisor, personnel administrator or EAP Counsellor/Advisor keeps temporary and informal notes concerning an individual for personal reference, these are not considered to be official, but are the property of the originator. These shall be classified CONFIDENTIAL and shall be disposed of promptly when no longer needed, in accordance with departmental procedures for the disposal of classified material.

6. The information or data referred to under paragraphs 2 and 3 of this Appendix shall, as applicable, be subject to the requirements of the Canadian Human Rights Act, Part IV, and the Regulations pursuant thereto with respect to both the protection of personal information and status as Federal Information Banks. Such records are to be retained for a minimum of 2 years after the most recent reference to administrative action, or as may be otherwise specified in official schedules governing the disposal of such records.



S T A N D A R D S





## STANDARDS

### Introduction

Occupational health and safety Standards have been established for application as an integral part of the work operations and activities throughout the Public Service of Canada. The detailed provisions contained in the Standards are designed to prevent accidents and employee injuries, and to protect employees against exposure to unhealthy environmental or occupational factors associated with their employment.

Departments and agencies, through appropriate internal lines of delegation and authority, are responsible for the effective implementation and on-going application of these Standards. The Treasury Board monitors their application through the survey and inspection services of Labour Canada and Health and Welfare Canada.



Application

1. This Standard applies to all Public Service departments and agencies, as defined in Part I of Schedule I of the Public Service Staff Relations Act.

Definitions

2. In this Standard
  - (1) "authorized inspection agency" means the provincial or territorial inspection authority designated by the Minister to inspect boilers, pressure vessels or plants for specified geographical areas;
  - (2) "boiler" means a fired pressure vessel including flanged nozzles, screwed or welded connections in which gas or vapour may be generated or a gas, vapour or liquid may be put under pressure by heating;
  - (3) "certificate of inspection" means a certificate issued by an inspection agency in respect of a boiler, pressure vessel or plant certifying that it has been inspected and conforms to the minimum standards of the Code;
  - (4) "Certification of Qualification" means a certificate issued under the applicable provincial or territorial boiler and pressure vessel statute or ordinance, certifying that the holder thereof has the necessary qualifications for the position for which the certificate is issued;
  - (5) "Code" means CSA standard B51-M1981, Code for the Construction and Inspection of Boilers and Pressure Vessels;
  - (6) "design" means the plans, patterns, drawings, and specifications of a proposed boiler, pressure vessel or plant;
  - (7) "designated inspection service" means the inspection authority, other than the authorized inspection agency, designated by the Minister to inspect boilers, pressure vessels or plants for specified geographical areas;
  - (8) "fitting" means a regulating, controlling or measuring device subject to internal pressure and attached to a boiler, pressure vessel or plant and includes a gauge cock, fusible plug, injector, pressure gauge, inspector's test cock, water column, feedwater level controller, pipe fittings and safety valve, stop-check, continuous blowdown, blowdown, soot blower, feedwater, water treatment, drain, vent and isolating valves;

- (9) "inspection agency" means the provincial, territorial or other inspection authority designated by the Minister to inspect boilers, pressure vessels or plants for specified geographical areas;
- (10) "major repairs" means repairs that may affect the strength of a boiler, pressure vessel or plant;
- (11) "maximum allowable pressure" means the maximum pressure at which a boiler, pressure vessel or plant is permitted to be operated (i.e. safety valve setting) as shown on the certificate of inspection;
- (12) "Minister" means the Minister of Labour;
- (13) "operating authority" means the Public Service department or agency responsible for the operation and/or maintenance of a boiler, pressure vessel or plant;
- (14) "plant" means a system of piping that contains a gas, vapour or liquid under pressure and includes any boiler or pressure vessel connected thereto;
- (15) "pressure" means pressure in kilopascals measured above the prevailing atmospheric pressure;
- (16) "pressure vessel" means a vessel, other than a boiler, that is used for containing, storing, distributing, processing or otherwise handling any gas, vapour or liquid under pressure and includes any pipe, fitting or other equipment attached to the vessel;
- (17) "qualified inspector" means a person who holds a current boiler inspector's certificate for the province or territory where the equipment is located or is to be installed;
- (18) "Regional Director" means a safety officer designated by the Minister to serve as Director in an area in which a Public Service occupancy or establishment is located;
- (19) "safety officer" means a person who is designated as a safety officer by the Minister pursuant to the Canada Labour Code, Part IV, Section 87;
- (20) "seal" means to take any measures necessary to prevent the unauthorized operation or use of a boiler, pressure vessel or plant;
- (21) "welding" means welding in connection with the fabrication, alteration or repair of a boiler, pressure vessel or plant;
- (22) "welding certificate" means a certificate, card or other form that attests to the acceptability of a welder's qualifications to weld in a province or territory in accordance with the requirements of the applicable provincial or territorial statute.

### Applicability

3. Subject to paragraph 4, this Standard applies to, or in respect of, the design, construction, installation, operation, maintenance and inspection of all boilers, pressure vessels and plants operated in the Public Service of Canada.
4. This Standard does not apply to
  - (1) a boiler that is used in connection with a hot liquid heating system that has no valves or other obstructions to prevent circulation between the boiler and an expansion tank that is vented freely to the atmosphere, provided the static head so created does not exceed 100 kPa measured at the outlet of the boiler;
  - (2) a heating boiler, as defined in the Code, that has a heating surface of 3 m<sup>2</sup> or less;
  - (3) a pressure vessel that has a capacity of 40 L or less;
  - (4) a pressure vessel that is installed for use at a pressure of 100 kPa or less;
  - (5) a pressure vessel that has an internal diameter of 150 mm or less;
  - (6) a pressure vessel that has an internal diameter of 600 mm or less and is used for the storage of hot water;
  - (7) a pressure vessel that is used exclusively for hydraulic purposes at ambient temperatures;
  - (8) a pressure vessel that has an internal diameter of 600 mm or less and is connected to a water-pumping system containing air that is compressed to serve as a cushion; and
  - (9) a refrigeration plant that has a capacity of 18 kw or less of refrigeration.

### Approval of Design

5. The operating authority shall ensure that where a boiler, pressure vessel or plant is being manufactured for use in the Public Service
  - (1) the design of the boiler or pressure vessel and the design of the plant is approved in writing by the authorized inspection agency;
  - (2) an authorized inspection agency is permitted to inspect the boiler, pressure vessel or plant at any time during its manufacture; and
  - (3) the manufacturer submits the design calculations of the boiler or pressure vessel when requested by the authorized inspection agency.

### Marking and Identification

6. The operating authority shall ensure that the provisions of the Code are complied with in respect of the marking and identification of any boiler, pressure vessel or plant used or to be used in the Public Service.

### Inspection During Installation

7. The authorized inspection agency may order the inspection of any boiler, pressure vessel or plant at any time during its installation.
8. When the authorized inspection agency is satisfied that a boiler, pressure vessel or plant has been inspected and conforms to the standards of the Code, the authorized inspection agency shall forthwith issue a certificate of inspection.
9. The authorized inspection agency may, in writing, authorize the temporary use of a boiler, pressure vessel or plant in the Public Service pending an inspection, if satisfied it can be used safely.

### Operation

10. No person shall operate or use, or permit to be operated or used, a boiler, pressure vessel or plant
  - (1) unless a certificate of inspection or a permit to authorize temporary use has been issued in respect of that boiler, pressure vessel or plant;
  - (2) unless every operator thereof is qualified in accordance with paragraph 11(6); and
  - (3) at a pressure higher than its maximum allowable pressure.
11. The operating authority shall ensure that
  - (1) every boiler, pressure vessel or plant has at least one safety valve or other approved equivalent fitting to relieve pressure at or below its maximum allowable pressure;
  - (2) where two or more boilers or pressure vessels are connected to each other in a plant for use at a common operating pressure, they are each fitted with one or more safety valves or other approved equivalent fittings to relieve pressure at or below the maximum allowable pressure of the weakest boiler or pressure vessel in the plant as shown on the certificate of inspection for that boiler or pressure vessel;
  - (3) no person alters, interferes with or renders inoperative any fitting attached to a boiler, pressure vessel or plant, except for the purpose of adjusting or testing the fitting, and on instructions from the inspection agency;

- (4) no person causes or permits holes to be cut or drilled in a boiler or pressure vessel for any purpose unless that person has been authorized to do so, and the proposed method approved in writing by the inspection agency, or instructed to do so as part of an inspection;
- (5) standards for control and supervision of the operation of boilers, pressure vessels and plants located in a province or territory are those standards established under the applicable provincial or territorial statute or ordinance;
- (6) with the exception of the provisions of paragraph 11(7), the qualifications and requirements of an operator of a boiler, pressure vessel or plant located in a province or territory are those qualifications and requirements established under the applicable provincial or territorial statute or ordinance;
- (7) any person employed as an operator under the provision of the Public Service Employment Act who holds a valid Certification of Qualification issued by any province or territory is considered qualified to operate a boiler, pressure vessel or plant in any province or territory for which an equivalent certificate is required.

#### Inspections

- 12. The Minister shall enter into agreement with an authorized inspection agency and designated inspection service to carry out inspections of boilers, pressure vessels and plants for specified geographical areas.
- 13. The inspection agency shall assign qualified inspector to inspect boilers, pressure vessels and plants in each geographical area.
- 14. Every boiler, pressure vessel and plant shall be inspected by a person referred to in paragraph 13 at least once every twelve months.
- 15. The inspection agency's representative, upon producing his or her credentials, may, at any reasonable time, inspect any boiler, pressure vessel or plant.
- 16. The operating authority shall ensure that, during any inspection of a boiler, pressure vessel or plant, there is a person in attendance who is capable of taking all the necessary precautions to ensure the safety of the person making the inspection.
- 17. Where it is impracticable to carry out an inspection in accordance with this Standard before the expiry of a certificate of inspection, the inspection agency, with the approval of the operating authority, may extend the term of the certificate by notice in writing to the operating authority.

18. Where, at any time after a certificate of inspection has been issued, an inspection is made pursuant to this Standard and it is found that a boiler, pressure vessel or plant is defective, the inspection agency may issue directions to the operating authority prescribing the conditions and limits of safety under which the boiler, pressure vessel or plant may be operated until the defect is repaired.
19. Every operating authority shall make and keep for at least ten years a record of each inspection made pursuant to paragraph 14, and each record shall
  - (1) be signed by the person who carried out the inspection;
  - (2) be available at all reasonable times for inspection by a safety officer; and
  - (3) include the date of the inspection and the identification and location of the boiler, pressure vessel or plant that was inspected.

#### Certificate of Inspection

20. A certificate of inspection shall show
  - (1) the date on which the inspection was made;
  - (2) the term for which the certificate is issued;
  - (3) the maximum allowable pressure or temperature at which the boiler, pressure vessel or plant may be used;
  - (4) the serial number and rated capacity of the boiler, pressure vessel or plant or such other identification as may be required; and
  - (5) the location of the boiler, pressure vessel or plant.
21. Every certificate of inspection shall be posted near the boiler, pressure vessel or plant to which it applies.
22. Where the authorized inspection agency inspects any boiler, pressure vessel or plant pursuant to paragraph 5, a certificate of inspection shall be issued in respect of that boiler, pressure vessel or plant if it conforms to the minimum standards of the Code.
23. Where the design of a boiler, pressure vessel or plant has been approved by the authorized inspection agency, but on inspection it is found that the boiler, pressure vessel or plant does not conform to that design, the authorized inspection agency may issue a certificate of inspection for that boiler, pressure vessel or plant, based on its design, but shall specify the maximum allowable pressure or temperature at which the boiler, pressure vessel or plant may be used.



24. The authorized inspection agency may issue a certificate of inspection in respect of a used boiler, pressure vessel or plant that is to be installed if the authorized inspection agency is satisfied that it conforms to the minimum standards of the Code.

#### Movement of a Boiler, Pressure Vessel or Plant

25. No person shall move or cause or permit to be moved a boiler, other than a portable boiler, or a boiler, pressure vessel or plant, the use of which has been prohibited pursuant to paragraph 28, unless written permission is given by the authorized inspection agency.

#### Repairs and Alterations

26. Where the inspection agency finds, upon inspection of a boiler, pressure vessel or plant, any defect or condition that may render the boiler, pressure vessel or plant unsafe, the inspection agency shall give directions in writing to the operating authority, specifying the repairs that are considered necessary to ensure safe operation thereof and specifying the period of time within which the repairs shall be made.
27. The operating authority shall ensure that
- (1) no person makes any major repairs to a boiler, pressure vessel or plant unless written approval is obtained from the authorized inspection agency; and
  - (2) any boiler, pressure vessel or plant to which major repairs have been made is not used until the repairs have been inspected by the authorized inspection agency and a new certificate of inspection has been issued.
28. Where the inspection agency or a safety officer finds, upon inspection of a boiler, pressure vessel or plant, a condition that makes the operation of that boiler, pressure vessel or plant unsafe, the inspection agency or safety officer shall notify the operating authority of the unsafe condition, and direct that the use of the boiler, pressure vessel or plant is prohibited. The inspection agency or safety officer shall also direct that the boiler, pressure vessel or plant is to be sealed in the manner prescribed, and cancel the existing certificate of inspection.
29. Where an inspection has been made by a safety officer, the safety officer shall notify the inspection agency of any directions given pursuant to paragraph 28.
30. Where the use of a boiler, pressure vessel or plant has been prohibited pursuant to paragraph 28 but, in the opinion of the inspection agency, the boiler, pressure vessel or plant may be capable of being repaired, the inspection agency shall give directions in writing to the operating authority, specifying the repairs and alterations that are required to return the boiler, pressure vessel or plant to a safe condition.

31. Where, pursuant to paragraph 30, directions have been given in respect of repairs and alterations to be made to a boiler, pressure vessel or plant, the operating authority shall ensure that the boiler, pressure vessel or plant is not used until the repairs and alterations have been inspected by the inspection agency and a certificate of inspection has been issued in respect of that boiler, pressure vessel or plant.
32. Where the use of a boiler, pressure vessel or plant has been prohibited pursuant to paragraph 28, and, in the opinion of the inspection agency, the boiler, pressure vessel or plant is not capable of being repaired or the operating authority does not wish to have it repaired, the operating authority shall specify a method of disposal that will effectively prevent further use of the boiler, pressure vessel or plant in the Public Service.
33. The operating authority shall ensure that the authorized inspection agency and designated inspection service are notified in writing of the removal from operation of a boiler, pressure vessel or plant.
34. The authorized inspection agency shall be notified immediately upon discovery of any condition in a boiler, pressure vessel or plant that may make the operation of the boiler, pressure vessel or plant unsafe.
35. Every operating authority shall ensure that
  - (1) all welding is performed by a person who possesses a current welding certificate; and
  - (2) every welding procedure, procedure qualification and performance test conforms to, or is the equivalent of, those specified in Section IX "Welding and Brazing Qualifications" of the ASME Boiler and Pressure Vessel Code, Section IX-1971, and those of the ANSI Code for Pressure Piping, B31.1-1973.

#### Reporting of Accidents

36. Every operating authority shall ensure that, within seventy-two hours of every accident or occurrence involving the use of a boiler, pressure vessel or plant that endangered the safety or health of any person, a record is made and that the record is kept for at least ten years and is available for examination by a safety officer or other responsible persons at all reasonable times.
37. Every record that is made pursuant to paragraph 36 shall include
  - (1) in the case of an accident, the date, time and place thereof;
  - (2) in the case of an occurrence other than an accident, a description thereof; and

(3) in every case

(a) the principal cause or causes, and

(b) any corrective action that was taken.

38. Every accident or occurrence referred to in paragraph 36 that results in a fatality or fire, or the rupture of a boiler, pressure vessel or plant, shall be reported to the Regional Director no later than twenty-four hours after the accident or occurrence.
39. No person shall disturb, destroy or alter any wreckage of a ruptured boiler, pressure vessel or plant unless permission to do so is given by a safety officer.
40. Notwithstanding paragraph 39, the wreckage of a ruptured boiler, pressure vessel or plant may be moved to the extent necessary to allow the safe removal of any person who has been injured in the accident or occurrence that caused the rupture.



Application

1. This Standard applies to all Public Service departments and agencies, as defined in Part I of Schedule 1 of the Public Service Staff Relations Act.
2. This Standard does not apply in respect of the transportation of dangerous substances over a public highway.
3. Regulations, including those concerning the use of radioactive substances, which are issued pursuant to the Atomic Energy Control Act, shall, where applicable, take precedence over the provisions of this Standard.
4. Requirements to safeguard the fire and explosion hazards of "dangerous substances" are the responsibility of the Dominion Fire Commissioner and are covered in Standards and Requirements issued by his Office under the authority of the Government Property Fire Prevention Regulations.

Definitions

## 5. In this Standard

- (1) "dangerous substance" means any substance that, because of a property it possesses, is dangerous to the safety or health of any person who is exposed to it;
- (2) "piping system" means an assembly of pipe, pipe fittings and valves, together with any pumps, compressors and other fixed equipment to which it is connected, that is used for transferring a dangerous liquid or gaseous substance from one location to another;
- (3) "qualified person" means a person who, because of his knowledge, training and experience, is qualified to perform safely and properly a specified job;
- (4) "radiation emitting device" means any device that is capable of producing and emitting energy in the form of
  - (a) electromagnetic waves having frequencies greater than ten megacycles per second (ten megahertz); and
  - (b) ultrasonic waves having frequencies greater than ten kilocycles per second (ten kilohertz);
- (5) "restricted area" means an area where explosives, flammable liquids, or flammable gases are stored, handled or processed or where the atmosphere contains or is likely to contain explosive concentrations of combustible dust or other combustible suspended material;

- (6) "safety officer" means a person designated by the Minister of Labour pursuant to Part IV of the Canada Labour Code; and
- (7) "environmental health officer" means a person so designated by Health and Welfare Canada.

#### Substitution of Non-Dangerous Substances

- 6. A dangerous substance or radiation emitting device shall not be used if it is reasonably practicable to use a substance or device that is not dangerous.
- 7. Where it is necessary to use a dangerous substance or a radiation emitting device and more than one kind of such substance or device is available, the one that is least dangerous is to be used, to the extent that it is reasonably practicable.

#### Isolation and Confinement

- 8. Where operations involve the use of a dangerous substance or a radiation emitting device in any area, the use of that substance or device and any hazard resulting from that use are to be confined within that area, to the extent that is reasonably practicable.
- 9. Where operations require the storing of dangerous substances in any area, they are to be stored, to the extent that is reasonably practicable, in a manner that will prevent the transmission of the effect of an explosion, fire or other accident in that area to any adjacent area.
- 10. A dangerous substance shall not be stored near another substance if the potential danger of the dangerous substance is likely to be increased thereby.
- 11. To the extent that is reasonably practicable, the quantity of a dangerous substance in any area where it is being used, processed or manufactured should not exceed
  - (1) the quantity that is consistent with good industrial safety practice, or
  - (2) the amount required for that area for one work day, whichever is the lesser.

#### Control of Airborne Contaminants

- 12. Any dangerous substance that may be carried by the air is to be confined as closely as is reasonably practicable to its source.
- 13. Subject to paragraph 14, each department shall ensure that the concentration of any dangerous substance that may be carried by the air in any area where an employee is working

- (1) does not exceed the threshold limit value recommended by the American Conference of Governmental Industrial Hygienists in its pamphlet "Threshold Limit Values for Air Borne Contaminants 1976", as amended from time to time; or
  - (2) conforms with any standard that follows good industrial safety practice, and is recommended by Labour Canada or Health and Welfare Canada.
14. Except in respect of any dangerous substance that is assigned a Ceiling "C" value by the American Conference of Governmental Industrial Hygienists, it is permissible for the concentration of a dangerous substance that may be carried by the air in the area where an employee is working to exceed the threshold limit value described in paragraph 13 for a period of time calculated according to a formula that
- (1) is prescribed by the American Conference of Governmental Industrial Hygienists or;
  - (2) is recommended by Labour Canada or Health and Welfare Canada.
15. Where the atmosphere of any area in which an employee is working is subject to contamination by a dangerous substance, the atmosphere is to be sampled and tested by a qualified person as frequently
- (1) as may be necessary to ensure that the level of contamination does not at any time exceed the safe limits prescribed by paragraphs 13 and 14; or
  - (2) as may be recommended by Labour Canada or Health and Welfare Canada.
16. The sampling and testing referred to in paragraph 15 shall comply with
- (1) a method recommended by the American Conference of Governmental Industrial Hygienists, the American Society for Testing and Materials, the Dominion Fire Commissioner; or
  - (2) any other sampling and testing method that follows good industrial safety practice, and is recommended by Labour Canada, Health and Welfare Canada or the Dominion Fire Commissioner.
17. A record of each test made pursuant to paragraph 15 shall be retained for at least three years.
18. Every record referred to in paragraph 17 shall
- (1) be signed by the person who carried out the test;
  - (2) be available at all reasonable times for examination by a safety officer or an environmental health officer; and

(3) include the following data:

- (a) the date, time and location of the test;
- (b) the number of persons normally occupying the area tested;
- (c) the dangerous substance for which the test was made;
- (d) the type of testing equipment used;
- (e) the result obtained; and
- (f) the name and occupation of the persons who made the test.

#### Personal Protective Equipment

19. Where it is not reasonably practicable to prevent harmful exposure to a dangerous substance or radiation-emitting device, personal protective equipment that will reduce such exposure to a safe level shall be worn and used.

#### Warning and Training of Employees

20. Each employee whose safety or health may be endangered by exposure to a dangerous substance or radiation-emitting device is to be informed of the danger.
21. An employee shall not use or handle, or be permitted to use or handle, a dangerous substance or radiation-emitting device where such use or handling would expose the employee to danger unless the employee has been instructed and trained
- (1) in the proper method to follow in order to minimize and control the danger; and
  - (2) in the emergency procedures to follow in the event of an accident involving that substance or device.
22. The method referred to in paragraph 21 shall
- (1) be set out in writing;
  - (2) follow good industrial safety practice; and
  - (3) be readily available for examination by any employee to whom it applies, and a safety officer or an environmental health officer.
23. A record of any training provided to employees relating to paragraph 21 should be retained for at least three years and be available for examination at all reasonable times.



## Signs

24. Where a dangerous substance or radiation-emitting device is handled, stored or used in any area in any manner that is dangerous to the safety or health of an employee who might be in that area, signs are to be posted to warn persons entering the area of that danger.

## Containers

25. Each department shall ensure that
- (1) every portable container for a dangerous substance that is used on its premises complies with a portable container specification prescribed for that dangerous substance in the Canadian Transport Commission Regulations for the Transportation of Dangerous Commodities by Rail, or with a portable container specification recommended by Labour Canada or Health and Welfare Canada;
  - (2) every stationary storage container for a dangerous substance that is used on its premises complies with a stationary storage container specification prescribed for that dangerous substance pursuant to a law of the province or territory in which the container is located, or with a stationary storage container specification recommended by Labour Canada or Health and Welfare Canada;
  - (3) every container for a radiation-emitting device that is used on its premises complies with a container specification prescribed for that radiation-emitting device by the Radiation Protection Bureau of Health and Welfare Canada.
26. Every container of a dangerous substance that is used is, with respect to its contents, to be labelled, marked or tagged in accordance with
- (1) the Canadian Transport Commission Regulations for the Transportation of Dangerous Commodities by Rail;
  - (2) The Manufacturing Chemists Association Guide to Precautionary Labelling of Hazardous Chemicals;
  - (3) the requirements of the Hazardous Products (Hazardous Substances) Regulations of Canada, or any other labelling standard that identifies the dangerous substance in the container by its common name, and lists the principal danger or dangers of that substance.

## Ventilation

27. Where there are a number of substances in the air in different areas of a workplace, a combination of which might cause a hazard, the air is to be exhausted from those areas in such a manner that the various substances are not combined.

28. Exhaust and inlet ducts for ventilation systems are to be located and arranged so as to ensure that air contaminated with dangerous substances does not enter areas occupied by employees.

#### Housekeeping

29. Each department shall ensure that

- (1) premises and equipment are, to the extent that is reasonably practicable, designed, constructed and maintained in a manner that will
  - (a) prevent the dust and waste from dangerous substances from accumulating in dangerous quantities, and
  - (b) facilitate the easy removal of the dust and waste referred to in paragraph 29 (1) (a);
- (2) all dust, waste material and any spill of a dangerous substance is:
  - (a) removed from its premises in such a manner and as frequently as will ensure a safe and healthful environment for employees and
  - (b) disposed of in a manner that does not endanger the health and safety of any employee.

#### Emergency Equipment

30. To the extent that is reasonably practicable, the following shall be provided:
- (1) emergency shower and eye-washing equipment, where there is a danger of skin or eye injury from corrosive substances;
  - (2) a fire blanket and a suitable portable fire extinguisher which meet the requirements of the Dominion Fire Commissioner, where there is a danger of fire due to the presence of flammable liquids or gases;
  - (3) rescue equipment, where there is a danger that a toxic substance may be released into, or an oxygen-deficient atmosphere created in, an area that would render any employee incapable of escaping without assistance;
  - (4) warning and detection systems where the seriousness of any danger so requires; and
  - (5) such other emergency equipment as may be necessary to ensure a standard of protection that is consistent with good industrial safety practice.

31. All equipment described in paragraph 30 shall be of a type and quantity that
- (1) is recommended by the Canadian Standards Association, the American National Standards Institute or the Dominion Fire Commissioner; or
  - (2) conforms with any other standard that is recommended by Labour Canada, Health and Welfare Canada, or the Dominion Fire Commissioner.

#### Combustible Dusts

32. Combustible dust collectors are to be designed, installed, operated and maintained in accordance with the requirements of the Dominion Fire Commissioner.
33. The exterior surface temperature of pipes or ducts exposed to combustible dusts and insulation used on those pipes or ducts shall comply with the requirements of the Dominion Fire Commissioner.

#### Restricted Areas

34. Measures and precautions concerning smoking, or any procedure or equipment the use of which in a restricted area may cause ignition or explosion of a dangerous substance, shall be in compliance with the requirements of the Dominion Fire Commissioner.

#### Compressed Air

35. An employee shall not use or be permitted to use compressed air for cleaning or any other purpose
- (1) where that use will result in a concentration of a dangerous substance in the atmosphere that is in excess of the prescribed safe limits referred to in paragraphs 13 and 14; or
  - (2) in such a manner that the air is directed forcibly against the body of the employee or any other person.
36. To the extent that is reasonably practicable, compressed air shall be used only with ventilated hoods or booths, or in areas where employees are protected fully from any dangerous substance or flying particles.

#### General Design of Workplaces

37. To the extent that is reasonably practicable, the design and construction of every place in which a dangerous substance is manufactured, handled, stored, processed or used, shall be such that
- (1) in an emergency, employees may be quickly evacuated;

- (2) where an accident is likely to result in a spill or leak of a dangerous substance or in a fire, the effect of such a spill, leak or fire on the safety and health of any employee is minimized;
  - (3) where a dangerous substance may explode, pressure resulting from any such explosion will be relieved in a manner that will prevent the explosive pressure from exceeding one pound per square inch (seven kilopascals).
38. Paragraph 37 does not apply to the handling, storing or using of a dangerous substance in a vehicle.

#### Piping Systems

39. Every piping system is to be
- (1) adequate for its intended purpose, having regard to the corrosiveness, pressure, temperature and other properties of the dangerous substance that is being conveyed; and
  - (2) fitted with valves and other control and safety devices sufficient to ensure the safe operation, repair and maintenance of the system.
40. Every valve and other control or safety device that is essential to the safe operation, repair or maintenance of a piping system is to be marked, tagged or otherwise identified by a system that follows good industrial safety practice and will assist in the safe use of that valve or other control or safety device.
41. Every person who operates, maintains or repairs a piping system or any part thereof is to be aware of the location of every valve and other control or safety device connected with that system and is to be trained in its proper and safe use.

#### Radiation Devices

42. Every radiation-emitting device to which any employee is exposed is to be
- (1) registered with the Radiation Protection Bureau, Health and Welfare Canada; and
  - (2) designed, constructed, installed, maintained and used in accordance with a standard that is acceptable to the Radiation Protection Bureau.

#### Electrical Safety

43. Where dangerous substances are present in hazardous quantities in a location, all electrical facilities used in that location shall comply with

- (1) the Canadian Standards Association Canadian Electrical Code Standard C22.1-1975, as amended from time to time; or
  - (2) any other safety standard that conforms with good industrial safety practice and is recommended by Labour Canada.
44. Where there is a danger of ignition or explosion of a dangerous substance due to static electricity, such hazard shall be controlled in accordance with the requirements of the Dominion Fire Commissioner.

#### Explosives

45. An employee shall not use, or be permitted to use dynamite, blasting caps or other explosive used in blasting unless he has in his possession a blaster's certificate that is issued
- (1) under the authority of a provincial, territorial or municipal authority; or
  - (2) by a qualified person recommended by the Regional Director of Labour Canada.
46. Where explosives are being used in an area that has been designated by a person in charge as a danger area, no unauthorized person, except a safety officer, shall enter that area.
47. Warning signs or guards shall be placed at the main entrances to any areas referred to in paragraph 46 to warn persons of the danger in that area.

#### Medical Examinations

48. Medical examinations for employees exposed to dangerous substances shall be administered as required in accordance with the Periodic Health Evaluation Standard, TB STD 3-13.
49. Where recommended by Health and Welfare Canada, appropriate records are to be maintained with respect to an employee's exposure to dangerous substances which may have an accumulative effect on the health of the employee.



Application

1. This Standard applies to all Public Service departments and agencies, as defined in Part I of Schedule I of the Public Service Staff Relations Act.

Definitions

2. In this Standard

- (1) "ampacity" means current-carrying capacity expressed in amperes;
- (2) "conductor" means a wire, cable or other form of metal installed for the sole purpose of conveying electrical current from one piece of electrical equipment to another or to ground;
- (3) "control device" means a device which will safely connect or disconnect an electrical facility to or from its source of energy;
- (4) "electrical facility" means any equipment, device, apparatus, wiring, conductor, assembly or part thereof that is used for the generation, transformation, transmission, distribution, storage, control, measurement or utilization of electrical energy and that has an ampacity and voltage that is dangerous to employees;
- (5) "guarantee of isolation" means, in respect of an electrical facility, a guarantee by the person in control of the facility that it is isolated;
- (6) "guarded" means that an electrical facility is covered, shielded, fenced, enclosed or inaccessible by location or otherwise protected in a manner that will prevent or reduce, to the extent that is reasonably practicable, danger to any person who might touch or go near that facility;
- (7) "high voltage" means a voltage of seven hundred and fifty-one volts or more between any two conductors or between any conductor and ground;
- (8) "insulated" means separated from other conducting surfaces by a dielectric material or air space having a degree of resistance to the passage of current and to disruptive discharge sufficiently high for the condition of use;

- (9) "isolated" means that an electrical facility is separated or disconnected from every source of electrical, mechanical, hydraulic, pneumatic or other kind of energy that is capable of making the facility dangerous;
- (10) "live" means that an electrical facility produces, contains, stores or is electrically connected to a source of alternating or direct current of an ampacity and voltage that is dangerous to employees, or contains any hydraulic, pneumatic or other kind of energy that is capable of making the facility dangerous to employees;
- (11) "person in charge" means a qualified person appointed to ensure the safe and proper conduct of an operation or of the work of employees;
- (12) "qualified person" means a person who, because of knowledge, training and experience, is licensed or otherwise qualified to perform safely and properly a specified job;
- (13) "safety ground" or "safety grounding" means a system of conductors, electrodes and clamps, connections or devices that electrically connect an isolated electrical facility to ground for the purpose of protecting employees working on the facility from dangerous electrical shock;
- (14) "safety officer" means a person so designated by the Minister of Labour pursuant to Part IV of the Canada Labour Code;
- (15) "voltage" means the greatest root-mean-square voltage between any two conductors of an electrical circuit, or between any conductor of a circuit and ground, and with respect to a direct current electrical circuit means the greatest voltage between any two conductors of the circuit or between any conductor of the circuit and ground.

Design, Construction, Installation, Operation,  
Use, Repair, Maintenance and Alteration

- 3. Every electrical facility shall be designed, constructed, installed, operated, used, repaired, maintained and altered in accordance with the requirements of the Canadian Electrical Code, the code of electrical facility standards published by the Canadian Standards Association.
- 4. Where practicable, plans and specifications in respect of new electrical facilities and/or major alterations to existing facilities, including plans relating to the installation or relocation of equipment and the location and siting of work areas, shall be submitted to the appropriate municipal or provincial agency for review and comment prior to the commencement of such work.



## General Precautions

5. No employee shall be permitted to install, modify, adjust, test, operate, repair or do any other similar work on an electrical facility, and no employee shall do any such work, unless the employee is a qualified person or the employee
  - (1) has been instructed and trained in
    - (a) the safe use of the tools and equipment required to do the work, and
    - (b) the safety precautions necessary to avoid injury to himself or herself and other employees, and
  - (2) does such work under the direct supervision of a qualified person.
6. Where an electrical facility is not live, but is capable of becoming live, no employee shall work on that facility unless it is completely isolated by a locking device and a safety ground is properly connected to that facility.
7. Where employees are working on or near an electrical facility that is live, or is capable of becoming live, the person in charge shall ensure that the electrical facility is guarded, or that other measures acceptable to a safety officer are taken to protect persons from injury.
8. Departments shall maintain an electrical hazard warning sign or symbol (in accordance with Canadian Standards Association standard CAN3-Z321-77, Signs and Symbols for the Occupational Environment) in a conspicuous place at every approach to any area that, because of its proximity to a live high voltage electrical facility, may be dangerous to employees.

## Consent to Work on a High Voltage Electrical Facility

9. No employee shall commence or be permitted to commence work on any high voltage electrical facility without the consent of the person in charge of that facility.
10. No employee shall enter alone or be permitted to enter any part of an electrical vault or station in which a live high voltage electrical facility is installed without the consent of the person in charge of that facility.
11. No employee shall operate a switch that makes a high voltage electrical facility live without the consent of the person in charge of that switch, except where, in the opinion of that employee, the operation of the switch is necessary to prevent loss of life or serious damage to property or equipment.

### Safety Watcher

12. Every person in charge of any employee working on or near a live electrical facility where, owing to the hazardous nature, condition or location of the work, it is necessary that the work be observed by a person not engaged in the work, shall appoint or act as a safety watcher to warn all employees on the work site of danger and to ensure compliance with the safety precautions and procedures prescribed for that work.
13. A safety watcher, or a person in charge who acts as such, shall be
  - (1) a qualified person;
  - (2) informed of the dangers involved in the work to be watched;
  - (3) trained and instructed in the procedure to follow in an emergency;
  - (4) clearly identified as a safety watcher;
  - (5) authorized to stop immediately any part of the work that is considered dangerous; and
  - (6) free of any other duties that might interfere with the duties of a safety watcher.

### Co-ordination of Work

14. Every employee, safety watcher and every other person who is working on, or in connection with, an electrical facility, shall be fully informed by the person in charge with respect to the safe co-ordination of their work.

### Special Tools and Equipment

15. To work or to be permitted to work on a live electrical facility the voltage of which, between any two conductors, is in excess of five thousand two hundred volts or, between any conductor and ground, is in excess of three thousand volts, an employee must be provided with the required insulated tools and equipment in accordance with good electrical safety practice for the safe performance of the work, and the employee must be trained and instructed in the safe use of such tools and equipment.
16. Where the instructions referred to in paragraph 15 are necessary for the safe performance of the work, written instructions, acceptable to Labour Canada, shall be prepared for the use of each employee who is engaged in that work, and a copy of such instructions shall be readily available for examination by a safety officer and by any employee required to work in accordance therewith.

## Protective Clothing and Equipment

### 17. No employee shall work on an electrical facility

- (1) that has not more than two hundred and fifty volts between any two conductors, or between any conductor and ground where there is a possibility of a dangerous electrical shock, or
- (2) that has more than two hundred and fifty volts but not more than five thousand two hundred volts between any two conductors, or not more than three thousand volts between any conductor and ground,

unless that employee uses such insulated protective clothing and equipment as is necessary, in accordance with good electrical safety practice, to protect the employee from injury during the performance of the work.

18. Where, in accordance with good electrical safety practice, protective headwear is required to be worn by an employee working on an electrical facility, such headwear shall comply with the Class B requirements of Canadian Standards Association standard Z94.1-M1977, Industrial Protective Headwear.
19. Unless otherwise recommended in writing by a safety officer, no employee shall work on or near a live high voltage electrical facility unless the employee is wearing outer clothing with full-length sleeves fastened at the wrists that is fabricated from tightly woven natural wool, non-flammable material or some other material that is equally resistant to ignition.
20. Any employee operating an unguarded electrical switch or other device, the operation of which may result in an electrical flash, flying molten metal or any other danger to an employee's eyes, shall wear safety glasses or some other eye protection which complies with Canadian Standards Association standard Z94.3-1969, Eye Protectors.

## Testing of Insulated Clothing, Equipment and Tools

21. Every article of insulated protective clothing, insulated equipment and insulated device or tool referred to in this Standard shall be so designed, constructed and maintained as to be safe, adequate and reliable under all conditions of intended use. Each article shall be tested by a qualified person using an approved method before initial use, and thereafter annually or more frequently as is necessary to ensure that it retains its integrity.
22. Each time an article or piece of protective clothing, insulated equipment or an insulated device or tool passes a test, it shall be clearly marked to show the date of the test.
23. Where any protective clothing, equipment, device or tool fails a test, it shall be immediately removed from the service for which it was designed and tested, and so marked, tagged or disabled as to prevent its use until it has been repaired and passed the test.

24. Tests of rubber insulating gloves and mitts shall follow a procedure that complies with Canadian Standards Association standard C104.3-1966, Rubber Insulating Gloves and Mitts, or a standard acceptable to Labour Canada.
25. Protective clothing, equipment, devices and tools shall be inspected by the user prior to use to ensure that each such item is safe for its intended use.

#### Poles and Elevated Structures

26. No employee shall climb or be permitted to climb any pole or elevated structure used to support an electrical facility unless qualified to do so, and until the employee has examined and tested that pole or structure and determined, to the extent that is reasonably practicable from such examination, that the pole or structure is safe for climbing.
27. Where it appears that a pole or elevated structure requires temporary supports to be safe for climbing, such supports shall be installed, and pike-poles alone shall not be used.
28. No employee shall work or be permitted to work on a pole or elevated structure unless the employee is qualified, properly equipped, and instructed and trained in the rescue of persons who may be injured in such work.
29. Every wooden pole or elevated structure that is embedded in the ground shall bear a permanent and always visible mark that is 3 m from the end that is embedded in the ground, or more than 3 m from that end providing the distance from the mark in metres from that end is clearly and permanently imprinted at or near the mark.
30. No employee shall climb or be permitted to climb or work from a pole or structure referred to in paragraph 29 that is located so near another structure or object, or has affixed to it any thing that is not part of the electrical facility, which interferes with the safe climbing of the pole or structure or the safe conduct of work therefrom.

#### Work Near Live Conductors

31. No employee shall work or be permitted to work near a live, unguarded or uninsulated electrical line or other conductor unless the special requirements contained in Procedure 1 are followed.

#### Isolation of Electrical Facilities

32. Where work is to be performed on an electrical facility, and the facility requires isolation to permit work or live tests to be performed thereon, or its isolation is changed or terminated, the special requirements contained in Procedure 2 shall apply.

### Capacitors

33. Where a capacitor that has an ampacity and voltage that is dangerous to employees is disconnected from its source of electrical energy, no person shall short-circuit or apply a safety ground to the capacitor within five minutes of the time it was so disconnected, unless the capacitor is already equipped with an adequate short-circuiting and grounding device.
34. Measures shall be taken to ensure that no person shall contact the terminals of a capacitor referred to in paragraph 33 unless the terminals are short-circuited and safety-grounded.
35. The short circuit and safety ground on the capacitor referred to in paragraph 34 shall remain in position until any work on the capacitor that involves contact by an employee is completed, and all persons are clear of the work area.

### Battery Rooms

36. Departments and agencies shall ensure that every room or area in which storage batteries that discharge flammable gases are electrically charged is adequately ventilated to prevent the accumulation of flammable gases, is as free as possible from all sources or causes of ignition, and is operated and maintained in accordance with the standards and requirements of the Dominion Fire Commissioner.
37. Each battery charging room or area shall be marked at the entrance thereto with a sign containing the words "Danger - No Smoking or Open Flames" and "Défense de fumer et d'utiliser une flamme nue" or other similar words in letters not less than 50 mm in height on a contrasting background. An approved warning symbol conveying the same meaning as the words specified for the aforementioned sign may be used in lieu.

### Switches and Control Devices

38. The access to every electrical switch, control device or meter shall always be free from obstruction, and control devices shall be so designed and located as to permit quick and safe operation at all times.
39. High voltage electrical switches or other control devices shall not be installed, operated or used for any purpose other than that for which that equipment was specifically designed and approved.
40. Where, for safety reasons, it is necessary that an electrical switch or other device controlling a supply of electrical energy is to be operated only by certain authorized persons, the switch or other device shall be fitted with a locking device or controlled in such a manner that no unauthorized person can operate it.

### Conductive Equipment

41. Metal rules, measuring tapes, metallic fish wire, wire-reinforced fabric tape, wire-bound hydraulic hoses, portable metal or metal-reinforced ladders or any similar electrically conductive equipment shall not be used so near to a live electrical facility that such conductive equipment may become live.

### Lightning Protection

42. Lightning protection devices shall comply with Canadian Standards Association standard B72-1960, Code for the Installation of Lightning Rods.

### Fire Prevention and Protection

43. Every electrical facility shall be designed, constructed, installed, operated, used, repaired, maintained and altered in accordance with the requirements and standards, as applicable, of the Dominion Fire Commissioner.

### Applicable Safety Codes or Regulations

44. Where, in the opinion of Labour Canada, a code, procedure or practice referred to in this Standard or utilized by a department may not provide a sufficient or appropriate degree of safety, Labour Canada may, in accordance with the procedures outlined in the Occupational Safety Policy for the Public Service, formally direct a department to apply or follow a specific code, procedure or practice which will provide the desired level of safety under the circumstances.

## PROCEDURE 1

### WORKING DISTANCES FROM LIVE CONDUCTORS

1. Subject to paragraph 2, no employee shall work so close to any live, unguarded or uninsulated electrical line or other conductor (the operating voltage of which is within a voltage range described in Column 1, Table 1) that the distance from any part of an employee's body, or any part of any thing with which the employee is in contact and that is normally capable of conducting electricity to the conductor, is less than the distance set out in
  - (1) Column 2, Table 1, where the employee is not a qualified person;
  - (2) Column 3, Table 1, where the employee is a qualified person; or
  - (3) Column 4, Table 1, where the employee is a qualified person and is following a procedure referred to in paragraph 2.
2. Where an employee referred to in paragraph 1 is working near a conductor described in that paragraph, and it is not reasonably practicable for such employee to properly perform the work at a distance that complies with that paragraph, the employee may work at such lesser distance as is acceptable to Labour Canada if the employee follows a special procedure that conforms to good electrical safety practice that is acceptable to Labour Canada.
3. Every person in charge of an employee who, in order to comply with this paragraph, is required to follow a special procedure referred to in paragraph 2, shall ensure that written instructions in respect of any such procedure are prepared, and are
  - (1) signed and dated by the person in charge;
  - (2) readily available for examination by any employee who is required to work on the electrical facility; by any person who is authorized to enter the work area; and by any safety officer; and
  - (3) retained on file for at least one year following the completion of the work.
4. No employee shall work near a conductor described in paragraph 1 where there is danger that, if the employee stumbled, fell or unintentionally moved, the distance from the conductor to any part of the body, or any part of any thing with which the employee is in contact and that is normally capable of conducting electricity, would be less than that required by paragraph 1.

TABLE 1  
DISTANCES FROM LIVE ELECTRICAL CONDUCTORS

<u>Column 1</u>				<u>Column 2</u>	<u>Column 3</u>	<u>Column 4</u>
Voltage Range of Conductor to Ground				Distance	Distance	Distance
1.	Over	425 to	12,000	3 m	0.9 m	0.3 m
2.	Over	12,000 to	22,000	3 m	1.2 m	0.45 m
3.	Over	22,000 to	50,000	3 m	1.5 m	0.6 m
4.	Over	50,000 to	90,000	4.5 m	1.8 m	0.9 m
5.	Over	90,000 to	120,000	4.5 m	2.1 m	1.2 m
6.	Over	120,000 to	150,000	6 m	2.7 m	1.5 m
7.	Over	150,000 to	250,000	6 m	3.3 m	2.1 m
8.	Over	250,000 to	300,000	7.5 m	3.9 m	2.7 m
9.	Over	300,000 to	350,000	7.5 m	4.5 m	3.3 m
10.	Over	350,000 to	400,000	9 m	5.4 m	3.9 m



PROCEDURE II  
ISOLATION OF ELECTRICAL FACILITIES

Related Instructions

1. Before an electrical facility is isolated to permit work or live tests to be performed thereon, or its isolation is changed or terminated, every person in charge who has issued oral instructions in respect of the operation of a control device that affects the isolation of that facility shall
  - (1) designate the device to which the instructions apply;
  - (2) where applicable, prescribe the correct sequence of operation;
  - (3) require that the instructions be repeated word for word or otherwise be assured that the instructions are understood; and
  - (4) make and sign a record in writing, which shall state
    - (a) the day and hour when the instructions were issued and, to the extent that is reasonably practicable, the day and hour of the commencement and of the termination of the period during which the instructions are to remain in force; and
    - (b) the name of the person to whom the instructions were issued.
2. Every record required to be made pursuant to paragraph 1 (4) shall be readily available to the persons concerned while the instructions are in force and thereafter be retained by the department for at least one year and be readily available for examination by a safety officer.

Isolation

3. Subject to paragraph 6, the department in charge of work on, or of any live test of, an isolated electrical facility shall ensure that
  - (1) no such work or test is undertaken until the person in charge, or a person authorized by the person in charge, has determined on the basis of visual observation that every control device and every blocking device necessary to establish and maintain the isolation of the facility
    - (a) is set in the safety position and with the disconnecting contacts of control devices safely separated;
    - (b) bears a distinctive tag or sign designed to notify persons that the operation of the control device and the movement of the blocking device is prohibited during the conduct of the work or test; and

- (c) is, where physically possible, locked or blocked in the safe position in such a manner that that position cannot be changed without the consent of the person in charge of the work or test;
  - (2) where it is appropriate and to the extent that it is reasonably practicable, isolation of the facility is confirmed by a test; and
  - (3) to the maximum possible extent, no person can inadvertently make the facility live while the work or test is in progress.
4. For the purpose of paragraph 3 (1) (a), the withdrawal to its full extent of a draw-out type electrical switch gear from the other part of that gear shall be deemed to be proper separation of the disconnecting contacts.
5. The person in charge of the work or test referred to in paragraph 3 shall, subject to paragraph 6, have possession or control of the key or other means of locking any control device referred to in paragraph 3 (1).
6. Where it is not reasonably practicable to comply with paragraphs 3 and 5, the person in charge shall ensure that no work on or live test of an isolated electrical facility is undertaken until a guarantee of isolation as prescribed by paragraph 9 has been given.
7. The tag or sign referred to in paragraph 3 (1) (b) shall
- (1) be suitably identified;
  - (2) contain the words "Do Not Operate", and "Défense d'actionner", or similar words or a symbol conveying the same meaning;
  - (3) where practicable, show the date and the hour, according to the 24-hour clock, that the control device and blocking device referred to in paragraph 3 (1) were set in the safe position;
  - (4) show the name or other means of identification of the person in charge of the work;
  - (5) where used in connection with a live test, be distinctively marked as a testing tag or sign;
  - (6) be removed only by the person in charge of the work or test, or a person authorized by the person in charge; and
  - (7) be destroyed or used for no other purpose when the work or test is completed.
8. Where more than one person is in charge of any work referred to in paragraph 3, a separate tag or sign referred to in paragraph 3 (1) (b) for each such person shall be applied to each control device and blocking device referred to in paragraph 3.

### Guarantees of Isolation

9. No employee shall give or be permitted to give a guarantee of isolation for an electrical facility unless the employee has been authorized in writing by the department responsible for the electrical facility to give that guarantee.
10. No more than one employee shall be permitted by the department responsible for the electrical facility to give a guarantee of isolation for an electrical facility for the same period of time.
11. Every guarantee of isolation shall be signed by the guarantor and shall state
  - (1) the date of issue thereof;
  - (2) the day and hour, according to the 24-hour clock, when the electrical facility will become isolated and, where reasonably practicable, the day and hour, according to the 24-hour clock, when the guarantee will be terminated;
  - (3) the procedures by which isolation will be assured;
  - (4) the name of the person in charge to whom it will be given; and
  - (5) whether live tests will be performed.
12. Where a guarantee of isolation in respect of an electrical facility is given to the person in charge of any work on, or live test of, the facility, the guarantor shall, whenever it is reasonably practicable to do so, hand a copy of the guarantee to that person before the work or test is undertaken.
13. Where it is not possible for the guarantor to hand a copy of the guarantee of isolation in respect of an electrical facility directly to the person in charge of any work on, or live test of, the facility, the guarantor shall give to that person an oral guarantee of isolation before any work or test is undertaken.
14. The oral guarantee of isolation referred to in paragraph 13 shall be forthwith recorded in writing by the guarantor as well as by the person in charge to whom the guarantee is given.
15. The written record referred to in paragraph 14 shall be signed by the person in charge to whom the guarantee of isolation was given and retained by the person in charge until the work on, or live test of, the electrical facility to which the record relates is completed, and that person has notified the guarantor that the guarantee is no longer necessary.

16. The department in charge of an electrical facility shall ensure that a copy of every guarantee of isolation and of every written record of an oral guarantee of isolation that is required to be made by this Standard is retained on file for at least one year and is readily available for examination by a safety officer or by any person affected by the guarantee.
17. No guarantee of isolation, or written record thereof in respect of any work on, or live test of, an isolated electrical facility, shall be given to any person in charge of such work or test who has not been authorized in writing by the department in charge of the electrical facility to receive that guarantee or record.
18. Every guarantor shall, before giving a guarantee of isolation, be assured, to the extent that is reasonably practicable, that the work to be done has been properly planned and will be performed in a safe manner.
19. Every person in charge of any work on, or live test of, an isolated electrical facility to whom a guarantee of isolation has been given shall ensure that all employees who are required to work on that facility are fully informed of the details of the guarantee of isolation, including the part or parts of the facility covered thereby and the exact period of time the facility will be isolated.
20. Where a guarantee of isolation has been given to a person in charge of any work or live test, and that person is replaced at the work site by another person in charge before the guarantee has terminated, the other person shall, if the guarantee is acceptable, sign the guarantee, but where, in that person's opinion, the guarantee is not acceptable, a new guarantee shall be obtained from the guarantor.
21. Where the employees working on an isolated electrical facility are divided into two or more crews, each of which is supervised by a person in charge of work on the facility, each such person in charge shall obtain a guarantee of isolation before the crew is permitted to begin work.
22. Where, in compliance with this Standard, an employee is required to give a guarantee of isolation for an electrical facility that obtains all or any portion of its electrical energy from a source that is not under the direct control of that employee, the department shall ensure that the guarantee shall not be given until the employee has obtained a guarantee of isolation in respect of the source from the person who is in direct control of that source and who is competent and authorized to give the guarantee in respect thereof.
23. Where electrical energy is supplied to an electrical facility from two or more sources which are under the control of other departments or employers, they may co-operatively agree that a guarantee of isolation for that electrical facility will be given in respect of each source of energy which shall be designated in writing by the other parties or on behalf of one of the parties as the party responsible for giving the guarantee.

24. The party having been designated pursuant to paragraph 23 as responsible for giving the guarantee may
- (1) act as the guarantor; or
  - (2) designate in writing one or more of its employees to act as the guarantor.
25. Every agreement referred to in paragraph 23 shall state
- (1) the identity of the facility to which the agreement applies;
  - (2) the period during which the agreement will remain in effect;
  - (3) the date of the agreement; and
  - (4) the name of the guarantor or guarantors, as the case may be, and shall be signed by the parties thereto.
26. A copy of every agreement referred to in paragraph 23 in respect of any guarantee of isolation shall be readily available to the persons affected by the guarantee while the agreement remains in effect and thereafter be retained by the guarantor for at least one year and be readily available for examination by any such person or by a safety officer.

#### Live Tests

27. No person shall give a guarantee of isolation for the performance of a live test of an isolated electrical facility unless that person is satisfied that
- (1) every existing guarantee of isolation for that facility is terminated;
  - (2) every person to whom any existing guarantee of isolation was given has been informed of its termination;
  - (3) no other guarantee of isolation has been given in respect of the facility for the period during which the guarantee will be in effect; and
  - (4) any tests to be performed on the facility will not endanger any person working thereon.
28. For the purposes of this paragraph, where a guarantee of isolation for the performance of a live test of an isolated electrical facility is given to a person in charge of the test, that person shall, while the test is being performed, be deemed to be the person in charge of the tests and of any other work that is being performed on the facility while the guarantee is in effect.

29. Every person in charge of a live test shall

- (1) warn all persons who, during or as a result of the test, are likely to be exposed to danger; and
- (2) after the test, ensure to the extent that is reasonably practicable that safe conditions are established.

#### Termination of Guarantee of Isolation

30. Subject to paragraph 33, every person in charge of work or tests on an electrical facility to whom a guarantee of isolation is given shall, when the guarantee of isolation is no longer required, personally inform the guarantor that the guarantee is no longer required, and provide such other information as the guarantor may require.

31. Any information that is given pursuant to paragraph 30 shall be recorded in writing by

- (1) the guarantor, or any person who has assumed the guarantor's responsibilities; and
- (2) the person to whom the guarantee of isolation was given.

32. Each record made pursuant to paragraph 31 shall show

- (1) the day and hour, according to the 24-hour clock, when the guarantee of isolation terminated;
- (2) the name of the guarantor or any person who has assumed the guarantor's responsibilities;
- (3) the person to whom the guarantee of isolation was given; and
- (4) the date and hour in accordance with the 24-hour clock that the guarantor was notified that the guarantee was no longer required.

33. Where it is not reasonably practicable to comply with paragraph 30, the department shall ensure that no guarantor or any other employee shall make live an electrical facility or part thereof for which a guarantee of isolation has been given until it is established beyond all reasonable doubt that it is safe to do so.

#### Safety Grounding

34. Subject to paragraphs 35 and 36, where a safety ground has not been applied to an isolated electrical facility and there is any possibility that the facility could become live, no employee shall make contact with the facility unless the employee follows procedures that are safe for use on live conductors.

35. While any live test is being made on an isolated electrical facility, the safety ground on that facility may be removed for the period of the test only by or under the direction of the person in charge of the test.
36. Safety grounding of an isolated electrical facility is not required if a safety measure is taken that is equally effective and is acceptable to the person in charge of the work.
37. Subject to paragraph 38, no employee shall apply a safety ground to an electrical facility until the employee has, wherever reasonably practicable, tested that facility to establish that it is isolated.
38. Paragraph 37 does not apply in respect of an electrical facility that is grounded by means of a grounding switch that is an integral part of the facility.
39. Subject to paragraph 40, no employee shall commence work on an electrical facility in an area in which is located any of the following facilities, namely

- (1) a grounding bus;
- (2) a station grounding network;
- (3) multi-grounded neutrals or other neutrals;
- (4) temporary phase grounding; or
- (5) metal structures;

unless each such facility is interconnected to the common grounding network.

40. Where, after the interconnections referred to in paragraph 39 are made, a safety ground is required to ensure the safety of an employee while working on an electrical facility referred to therein, the safety ground shall also be connected to the common grounding network.
41. No employee shall attach a safety ground to, or disconnect a safety ground from, an isolated electrical facility except in accordance with the following requirements:
  - (1) the safety ground shall, to the extent that is reasonably practicable, be attached to the pole, structure, apparatus or other thing upon which the work is to be done;
  - (2) all isolated conductors and all non-insulated surfaces, including the neutral conductor, shall be short-circuited, electrically bonded together and attached by a safety ground to a point of safety grounding in a manner that will establish equal voltage on all surfaces that can be touched by persons who work on the electrical facility;

- (3) the safety ground shall be attached by means of mechanical clamps that are tightened securely and in direct contact with bare metal;
- (4) the safety ground shall be so secured that none of its parts can make contact accidentally with any live electrical facility;
- (5) the safety ground shall be attached or removed only with an insulated device or tool;
- (6) the safety ground shall, before it is attached to an isolated electrical facility, be attached to a point of safety grounding; and
- (7) the safety ground shall, before being disconnected from the point of safety grounding, be removed from the isolated electrical facility in such a manner that the employee will avoid contact with all live conductors.

42. For the purpose of paragraph 41, a point of safety grounding means

- (1) a grounding bus, a station grounding network, a multi-grounded neutral or other neutrals, a metal pole line structure, or an aerial ground or static wire; or
- (2) one or more metal rods that are not less than 16 mm in diameter and are driven not less than 1 m into undisturbed compact earth at a minimum distance of 4.5 m from the base of the grounded structure or the area where persons on the ground must work and in a direction away from the main work area, but does not include a ground rod at the base of a pole that is not part of a common grounding system.

43. Every conducting part of a safety ground on an isolated electrical facility shall have sufficient ampacity to conduct the maximum current that is likely to be carried on any part of the facility for such time as is necessary to permit operation of any device that is installed so that, in the event of a short circuit or other electrical current overload on the facility, the facility will be automatically disconnected from its source of electrical energy.



Application

1. This Standard applies to all Public Service departments and agencies as defined in Part I of Schedule 1 of the Public Service Staff Relations Act.

Definitions

## 2. In this Standard

- (1) "Act" means Part IV of the Canada Labour Code;
- (2) "CSA Elevator Code" means the Safety Code for Elevators, Dumbwaiters, Escalators and Moving Walks of the Canadian Standards Association standard B44-1975 as amended from time to time;
- (3) "certificate of inspection" means a certificate or licence issued by a Chief Inspector under paragraph 7;
- (4) "Chief Inspector" means the safety officer designated by the Minister as Chief Inspector for elevating devices for a defined geographical area;
- (5) "design" means the plans, patterns, drawings and specifications of an elevating device;
- (6) "elevating device" means a fixed mechanical device for moving passengers or freight and includes an elevator, escalator or dumbwaiter, as defined in the CSA Elevator Code, an inclined lift, moving sidewalk or other similar elevating device but does not include a manlift;
- (7) "major alteration" means those alterations set out in Section 10 of the CSA Elevator Code;
- (8) "manlift" means:
  - (a) a manually-controlled passenger hoisting and lowering mechanism that is equipped with a car or platform, the floor area of which does not exceed nine square feet ( $0.9 \text{ m}^2$ ) and that moves in guides in a substantially vertical direction under electrical or manual power or power provided by a system of counterweights; and
  - (b) a mechanism having a power-driven endless belt that revolves around fixed pulleys at the top and bottom limits of its travel, with attached steps or platforms and handholds for lifting or lowering persons in a substantially vertical direction;

- (9) "maximum carrying capacity" means, with respect to an elevating device, the load that the elevating device is designed and installed to lift safely;
- (10) "Minister" means the Minister of Labour;
- (11) "person in charge" means a qualified person appointed by a department to ensure the safe and proper conduct of an operation or the work of employees;
- (12) "qualified person" means a person who, because of knowledge, training and experience is qualified to perform safely and properly a specified job;
- (13) "Regional Director" means the officer designated by the Minister to serve as Director in an area in which a Public Service occupancy or establishment is located;
- (14) "safety device" means any device intended:
  - (a) to aid in the prevention of the unsafe operation or use of an elevating device; or
  - (b) to minimize personal injury and property damage.
- (15) "safety officer" means a person designated as a safety officer by the Minister pursuant to Section 87 of the Act; and
- (16) "seal" means to take any measure approved by the Chief Inspector that will effectively prevent the unauthorized operation or use of an elevating device or manlift.

#### Specific Application and Exclusions

- 3. Subject to paragraph 4, this Standard applies to all elevating devices and manlifts used in the Public Service.
- 4. This Standard does not apply to
  - (1) a belt, bucket, scoop, roller or similar type conveyor;
  - (2) a portable tiering or piling machine that is used to move material to and from storage and that is located and operated within one storey;
  - (3) equipment for feeding or positioning materials;
  - (4) a hoist for raising or lowering materials that is provided with unguided hooks, slings or similar means for attachment to the materials;

- (5) a lubrication hoist or similar mechanism;
- (6) a lift bridge;
- (7) a railroad car lift or dumper;
- (8) a vertical conveyor that is inoperable from within its car and that is not equipped with a platform designed for carrying a person.

#### Approval and Registration

- 5. No person shall undertake the installation or major alteration of an elevating device unless the design has been approved by the Chief Inspector.
- 6. Every elevating device shall be designed, constructed and installed in accordance with the CSA Elevator Code.
- 7. Where the Chief Inspector is satisfied that an elevating device complies with the minimum standards of the CSA Elevator Code and has been found on inspection to be safe to operate, he shall forthwith issue a certificate of inspection or a licence.

#### Operation

- 8. No person shall operate or use an elevating device or permit an elevating device to be operated or used
  - (1) unless a certificate of inspection has been issued in respect of that elevating device; or
  - (2) in excess of the maximum carrying capacity for that elevating device as shown on the certificate of inspection.
- 9. No person shall alter, interfere with or render inoperative any safety device attached to an elevating device or manlift except for the purpose of testing the safety device in accordance with the instructions of the Chief Inspector or his authorized representative.
- 10. No person shall operate or use an elevating device or manlift or permit an elevating device or manlift to be operated or used while a safety device connected thereto is inoperative, except for testing purposes authorized by the Chief Inspector or an authorized safety officer.
- 11. Subject to paragraph 12, no person shall operate or be permitted to operate a passenger elevating device if, in the opinion of the Chief Inspector, he is not qualified to do so.
- 12. Paragraph 11 does not apply to the operation of a passenger elevating device equipped with automatic controls and emergency stopping devices that ensure the safety of the persons using the elevating device and that are acceptable to the Chief Inspector.

13. A certificate of inspection and any other notices or markings that the Chief Inspector requires to be posted shall be posted near the elevating device to which they apply or in such other place as the Chief Inspector or a safety officer authorized by him may direct.
14. No person, other than the Chief Inspector or a safety officer authorized by him, shall inspect an elevating device.
15. Every elevating device shall be inspected at least once every twelve months unless that period is extended in writing by the Chief Inspector.
16. Notwithstanding paragraph 15, the Chief Inspector or Regional Director may at any time order the inspection of an elevating device or manlift.
17. The department or person in charge of an elevating device or manlift shall, when requested by a person conducting an inspection pursuant to this Standard, provide that person with an assistant who is capable of taking all precautions necessary to ensure that person's safety during the inspection and to otherwise assist him in the safe conduct of the inspection.
18. Where the Chief Inspector, or a safety officer authorized by him to conduct inspections, finds on inspection that an elevating device or manlift is not safe to operate, he shall in accordance with the procedure authorized in the Occupational Safety Policy for the Public Service of Canada:
  - (1) seal the elevating device or manlift; and
  - (2) take possession of or cancel the certificate of inspection, if any.
19. Where the inspection referred to in paragraph 18 is made by a person other than the Chief Inspector that person shall immediately notify the Chief Inspector that the use of the elevating device or manlift is prohibited.
20. The department or person in charge of an elevating device or manlift shall, upon discovery of any defect or condition in the elevating device or manlift that may render it unsafe to operate, immediately notify the Chief Inspector or the nearest Regional Office of Labour Canada.

#### Maintenance and Repair

21. The department or person in charge of an elevating device or manlift shall ensure that it is maintained and repaired in accordance with any standard that follows good general industrial safety practice and that is acceptable to the Regional Director or the Chief Inspector.
22. No person shall carry out maintenance or repair work on an elevating device or manlift unless he is a qualified person.

## Manlifts

23. Where manlift safety requirements are prescribed in a statute set out in Column II of Table I, all manlifts installed on or after the coming into force of this Standard in a Public Service establishment in the province set out in Column I opposite that statute shall comply with these requirements.
24. All manlifts installed on or after the coming into force of this Standard in a Public Service establishment in a province set out in Column I of Table I and for which manlift safety requirements are not prescribed under the statute set out opposite that province in Column II thereof shall
  - (1) in the case of a manlift described in paragraph 2 (8) (a), be installed and comply with any standard that follows good general industrial safety practice and that is acceptable to the Regional Director or the Chief Inspector;
  - (2) in the case of a manlift described in paragraph 2 (8) (b), comply with the American National Standards Institute standard for Manlifts A90.1-1969 as amended from time to time, or any other standard acceptable to the Regional Director or Chief Inspector.
25. Where a manlift that was installed prior to the coming into force of this Standard is declared in writing by a safety officer or by an authorized representative of the Chief Inspector to be unsafe, the department responsible for the operation and maintenance of that manlift shall ensure that it is not operated or used until it has been repaired or altered to the satisfaction of the Chief Inspector or the Regional Director.

## Reporting of Accidents

26. Departments shall ensure that the person in charge of an elevating device or manlift maintains a complete record, in a form acceptable to the Chief Inspector, of every accident involving that elevating device or manlift.
27. The record referred to in paragraph 26 shall be available for examination by a safety officer within 72 hours of the accident.
28. Departments responsible for the operation and maintenance of an elevating device or manlift shall ensure that the Chief Inspector is notified as soon as reasonably practicable and in no case later than 24 hours of any accident or occurrence that results in
  - (1) the elevating device or manlift falling freely;
  - (2) a fatality;

- (3) an injury to any person that requires attention by a medical practitioner; or
  - (4) damage requiring repairs by an elevator mechanic.
29. Subject to paragraph 27, no person shall disturb, destroy or alter any wreckage of an elevating device or manlift without permission from a safety officer.
30. The wreckage of an elevating device or manlift may be moved to the extent necessary to permit the safe removal of an injured person.

Note: The standards referred to in this Standard are available from the sources indicated hereunder:

Canadian Standards Association standards:

Canadian Standards Association,  
178 Rexdale Boulevard,  
Rexdale, Ontario.  
M9W 1R3

American National Standards Institute standards:

American National Standards Institute,  
1403 Broadway,  
New York, New York 10018,  
U.S.A.

TABLE I  
PROVINCIAL ELEVATING DEVICE STATUTES

<u>COLUMN I</u>	<u>COLUMN II</u>
1. Alberta	- <u>The Elevator and Fixed Conveyances Act</u> being Chapter 17 of the Statutes of Alberta, 1962.
2. British Columbia	- Part II of the <u>Factories Act</u> being Chapter 14 of the Statutes of British Columbia, 1966.
3. Manitoba	- <u>The Elevator Act</u> being Chapter 26 of the Statutes of Manitoba, 1963.
4. New Brunswick	- <u>Elevators and Lifts Act</u> being Chapter 4 of the Statutes of New Brunswick, 1960.
5. Newfoundland	- <u>The Elevator Act, 1969</u> being Chapter 63 of the Statutes of Newfoundland and Labrador, 1969.
6. Northwest Territories	- <u>Elevator and Fixed Conveyances Regulations</u> under <u>The Workmen's Compensation Ordinance</u> being Chapter 22 of the Ordinances of the Northwest Territories, 1967.
7. Nova Scotia	- <u>Elevators and Lift Act</u> being Chapter 8 of the Revised Statutes of Nova Scotia, 1967.
8. Ontario	- <u>The Elevators and Lifts Act</u> being Chapter 119 of the Revised Statutes of Ontario as amended by Chapter 38 of the Statutes of Ontario, 1965.
9. Prince Edward Island	- <u>Elevators and Lifts Act</u> , being Chapter 20 of the Statutes of Prince Edward Island, 1970.
10. Quebec	- <u>Public Building Safety Act</u> being Chapter 149 of the Revised Statutes of Quebec and the <u>Industrial and Commercial Establishments Act</u> being Chapter 150 of the Revised Statutes of Quebec.

COLUMN I

11. Saskatchewan

12. Yukon Territory

COLUMN II

- The Passenger and Freight Elevator Act  
being Chapter 376 of the Revised Statutes  
of Saskatchewan, 1965.
- Elevator and Fixed Conveyances Ordinance,  
being Chapter E3 of the Ordinances of the  
Yukon Territory, 1971.



Application

1. This Standard applies to the Public Service departments and agencies defined in Part I of Schedule I of the Public Service Staff Relations Act.

Definitions

2. In this Standard
  - (1) "field party" means a field survey or field operations party, or a party operating in an area which is generally more than two hours' travel time by usually available transportation from the nearest medical treatment facility. However, in any unusual circumstances, a department may apply this term to parties operating at locations less than two hours' travel time from such a facility;
  - (2) "first aid" means emergency medical treatment or care that conforms with the recommended practice of the St. John Ambulance Association, and that is provided by a department or agency in respect of an injury or illness of an employee arising out of or in the course of employment;
  - (3) "first aid attendant" means a person who is qualified in accordance with paragraph 9 and who provides first aid services on a voluntary basis in conjunction with his or her regular duties;
  - (4) "first aid kit" means an approved container with approved first aid supplies;
  - (5) "first aid room" means a room provided by a department or agency to be used exclusively for purposes of administering first aid;
  - (6) "first aid station" means a place, other than a first aid room, where a first aid kit and equipment are located;
  - (7) "medical treatment facility" means a hospital, medical clinic or physician's office.
3. Unless otherwise indicated in this Standard, all references to Health and Welfare Canada are to Emergency Services, Medical Services Branch, Health and Welfare Canada.

Departmental Responsibilities

4. Departments and agencies are responsible for ensuring that first aid services are available to employees in accordance with the requirements of this Standard. Where an employee's normal work is located beyond departmental premises, the department concerned shall ensure that first aid services are made available to such an employee.

### First Aid Treatment and Reporting

5. Any employee, upon sustaining an injury or sudden illness while at work, shall, where possible, report to a first aid attendant for treatment and, as soon as is practicable thereafter, supply all pertinent information relative to the injury or illness to the person in charge of the work. Where it appears that a physician's attention may be required, the employee shall be promptly referred to a medical treatment facility, and the department shall ensure that suitable transportation and escort, if required, is arranged.
6. Departments and agencies shall maintain, at each place of employment, a written record of every injury or illness which requires first aid treatment, and such record shall be maintained for five years following treatment. Treatment records shall include:
  - (1) the full name of the person receiving treatment;
  - (2) the date and time that the injury or illness was incurred;
  - (3) the date and time that the injury or illness was reported;
  - (4) a brief description of the nature of the injury or illness; and,
  - (5) a brief description of the treatment rendered and any arrangements made relating to the person treated.
7. Each record of entry shall be signed by the first aid attendant or person rendering first aid. Records of treatment shall be inspected by a responsible departmental official at three-month intervals to verify their proper maintenance.

### First Aid Attendants

8. Departments shall ensure that an adequate number of first aid attendants are available to render first aid to employees during working hours, and at least one attendant shall be available at all times during each shift or working period at a location. For field parties, at least two first aid attendants shall be included in each main party, and at least one attendant among the members of each branch party.
9. Each first aid attendant shall hold a valid St. John Ambulance Standard First Aid Certificate, or an equivalent level of first aid certification which is acceptable to Health and Welfare Canada. Departments shall maintain a record of each attendant's first aid qualification and ensure that certification is kept up-to-date as required. Lists containing the names, certification status and the location of first aid attendants shall be maintained in an up-to-date status.

10. Notwithstanding additional responsibilities that may be assigned by a department or agency, first aid attendants shall be responsible for
  - (1) ensuring the good order and maintenance of first aid kits, supplies and related equipment and records;
  - (2) providing first aid treatment within the scope of their competence; and
  - (3) referring an employee to a medical treatment facility, where required.

#### First Aid Training

11. Departments shall normally make arrangements for the first aid training and certification of employees through the appropriate office of the St. John Ambulance Association. In the National Capital Region, such arrangements shall be made through Health and Welfare Canada.
12. First aid training shall be provided for employees who have been designated by the department as requiring such training, and where the incumbents voluntarily agree to act as first aid attendants. The positions so identified will depend upon several factors, including the number and location of first aid stations, first aid rooms and health units, and the degree of hazard of the work.
13. Where unusual and variable occupational hazards may exist, such as those found in laboratories or during field operations, Health and Welfare Canada shall be consulted in regard to specialized first aid training and/or equipment which may be required.

#### First Aid Kits

14. Except where a first aid room or a health unit is operating reasonably close to the work, departments shall provide and maintain at least one first aid station at each place of employment. First aid kits for placement at these fixed locations shall contain the items detailed in Table 1, such items to be obtained from Supply and Services Canada. First aid kits are to be provided in accordance with the following scale:
  - (1) 1 to 9 employees - one Type "A" First Aid Kit; or,
  - (2) 10 to 49 employees - one Type "B" First Aid Kit; or,
  - (3) 50 to 199 employees - one Type "C" First Aid Kit.
15. A motor vehicle may, at the discretion of the department or agency operating such vehicle, be equipped with a Type "A" First Aid Kit. In the case of smaller vehicles, such as snowmobiles, Pocket First Aid Kits referred to in paragraph 16 (3) may be provided.

16. For operations in the field, parties shall be equipped with first aid kits as detailed in Table 2, such kits to be provided in accordance with the following requirements:
  - (1) main party - one Standard First Aid Kit;
  - (2) each party detached from the main party - one Intermediate First Aid Kit; and
  - (3) individual members who are isolated during operations - one Pocket First Aid Kit.

#### First Aid Rooms

17. A first aid room shall be provided to serve a location where there are 200 or more employees working at any one time. A first aid room may be provided to serve a lesser number of employees, if justified according to the types of operations and the injury hazard and experience at the location. A first aid room is not required where a health unit or a similar emergency treatment facility is conveniently available to provide first aid services.
18. Where, at a location, the total number of employees of more than one department substantiates the need for a first aid room, a common first aid room may be established under co-ordinated control as agreed upon locally between the departments concerned. Should a common first aid room prove impracticable, first aid stations as required by paragraph 14 shall be established by the individual departments.
19. First aid rooms shall be maintained in a neat and sanitary condition, be located within easy access of male and female toilet facilities, and be situated convenient to the main working areas.
20. A first aid room shall have a minimum floor area of  $15 \text{ m}^2$  and shall be provided with
  - (1) adequate lighting, heating and ventilation;
  - (2) a sink and hot and cold running water;
  - (3) liquid soap and dispenser;
  - (4) a separate cubicle or curtained-off area with a cot or bed;
  - (5) a cabinet or cupboard space with a lock, suitable for the storage of first aid supplies;
  - (6) a suitable table and several chairs;
  - (7) paper towels and dispenser;
  - (8) paper cups and dispenser;

- (9) a telephone, or continuous access to an adjacent telephone;
- (10) a Type "A" First Aid Kit and flashlight for use at the scene of an accident; and
- (11) first aid supplies in accordance with Table 3.

#### Emergency Communications

- 21. All telephone numbers which may be required in respect of any emergency shall be conspicuously posted at each first aid station and first aid room, and such numbers shall, as a minimum, include the following:
  - (1) first aid attendant;
  - (2) emergency transportation (including taxis);
  - (3) medical treatment facility;
  - (4) fire department; and,
  - (5) police department.
- 22. Communication by land-line or radio shall be established between field parties and those facilities which can provide emergency medical advice, assistance or rescue services, including those operated by the Medical Services Branch, Health and Welfare Canada. Communications shall also be maintained between main camps and parties working out of such camps, whenever possible.

#### Location of First Aid Facilities

- 23. The direction to, and location of, each first aid station and first aid room shall be indicated by symbols in accordance with requirements specified in the Federal Identity Program Guide "Graphic Symbols".

#### Field Operations

- 24. Before proceeding on field operations, the person in charge of a field party shall
  - (1) ensure that the required number of first aid attendants is available;
  - (2) obtain the required first aid kits and other first aid supplies required under this Standard; and,
  - (3) contact the medical treatment facility nearest the intended work area to arrange for emergency services. Normally, the appropriate regional Medical Services Branch office of Health and Welfare Canada shall be contacted for this purpose.

25. When parties will be operating under conditions which may require special supplies beyond those considered as normal first aid requirements, departments shall obtain the approval of Health and Welfare Canada before such supplies are acquired.
26. Whenever a camp is to be established as a base for field operations, the person in charge of the party shall ensure that arrangements have been made for emergency evacuation of casualties and for the communication procedures required to obtain medical advice and/or assistance, and that all members of the party have been advised of such arrangements.

#### Other First Aid Matters

27. Departments shall, where necessary, consult with Health and Welfare Canada concerning approval and direction respecting
  - (1) first aid matters not specifically covered by this Standard;
  - (2) the interpretation and application of existing first aid requirements; and
  - (3) the provision of specific first aid supplies and equipment not detailed in this Standard.

TABLE I  
GENERAL PURPOSE FIRST AID KITS

DESCRIPTION	QUANTITY			STOCK NUMBER (SSC)
* First Aid Kit, General Purpose, Type "A", complete	1			6545-21-852-9432
First Aid Kit, General Purpose, Type "B", complete		1		6545-21-852-9433
First Aid Kit, General Purpose, Type "C", complete			1	6545-21-852-9434
KIT CONTENTS	A	B	C	
Adhesive tape, surgical, 7.5 cm x 4.6 m	1	1	2	6510-00-203-5000
Ammonia Inhalant	10	10	10	6505-21-114-6650
Applicator, disposable, 25's	2	4	4	6515-21-852-9428
Bandage, adhesive, 100's	1	1	1	6510-21-845-2239
Bandage, felt, orthopaedic	-	2	2	6510-21-116-0170
Bandage, gauze, 5.0 cm x 4.6 m	-	6	8	6510-21-116-0174
Bandage, gauze, 7.5 cm x 4.6 m	3	6	8	6510-21-116-0175
Bandage, gauze, 10.0 cm x 5.46 m	-	6	8	6510-21-849-9537
Bandage, triangular, 2's	1	3	6	6510-21-880-9702
**Basin, wash	-	-	1	6530-21-846-9260
Benzalkonium Chloride Tincture	1	3	3	6505-21-852-9421
**Blanket, bed, grey	-	-	2	7210-21-849-9452
Book, Pocket Guide to First Aid	1	-	-	7610-21-843-6190
Brush, scrub, nail	-	-	1	7920-21-116-2811
Case, First Aid Kit	1	-	-	6545-21-852-9431
Case, First Aid Kit	-	1	-	6545-21-852-9429
Cotton, purified, 28.0 g	2	4	16	6510-21-116-0197
Cup, paper, 10's	-	-	4	7350-21-852-9407
Depressor, tongue, 25's	2	4	4	6515-31-852-9427
Dressing, first aid, field	2	2	3	6510-21-102-7867
Dressing, surgical, combination	-	2	3	6510-21-849-9539
Forceps, splinter	1	1	1	6515-00-337-2400
**Litter, folding	-	-	1	6530-21-848-4908
Pad, cotton, eye	1	2	4	6510-21-845-2189
Pin, safety, 9's	1	1	2	8315-21-843-6856
Scissors, bandage	1	1	1	6515-21-846-0206
Shield, eye, surgical	1	2	4	6515-21-116-3164
Soap, surgical	-	-	1	6505-21-855-2230
Splint set, wood	-	1	1	6545-21-116-2912
Sponge, surgical, 5.0 cm x 5.0 cm, 2's	3	6	12	6510-21-845-2171
Sponge, surgical, 10.0 cm x 10.0 cm, 2's	3	6	12	6510-21-845-2440
* Additional for Motor Vehicles: Dressing, first aid, field	2	-	-	6510-21-102-7867

\*\*Item is not included in kit, and must be ordered separately.

TABLE II  
FIELD PARTY FIRST AID KITS

DESCRIPTION	ABBREVIATION			
* Standard First Aid Kit	S			
* Intermediate First Aid Kit		I		
* Pocket First Aid Kit			P	
KIT CONTENTS	QUANTITY			STOCK NUMBER (SSC)
Acetaminophen Tablets, 100's	1	1	-	6505-21-870-6175
Adhesive tape, surgical, 7.5 cm x 4.6 m	1	1	-	6510-00-203-5000
Aluminum hydroxide and Magnesium Carbonate Gel Tablets, 50's	2	2	-	6505-21-857-6473
Applicator, disposable, 100's	1	-	-	6515-21-844-5204
Bandage, adhesive, butterfly closure, 100's	1	1	-	6510-21-845-2182
Bandage, adhesive, 25's	-	1	1	6510-21-845-2238
Bandage, adhesive, 100's	1	-	-	6510-21-845-2239
Bandage, cotton, elastic, 7.5 cm	4	2	-	6510-21-845-2449
Bandage, gauze, 7.5 cm x 4.6 m	6	4	-	6510-21-116-0175
Bandage, triangular, 2's	8	4	1	6510-21-880-9702
Bath, eye	1	-	-	6515-21-844-5214
Blanket, emergency, pocket	-	-	1	7210-21-870-6172
Book, First Aid, English	1	-	-	7610-21-848-3664
Book, First Aid, French	1	-	-	7610-21-848-3665
Book, Pocket Guide to First Aid	-	1	-	7610-21-843-6190
Brush, scrub, nail	1	-	-	7920-21-116-2811
Calamine lotion	1	1	-	6505-21-870-6173
Case, First Aid Kit	1	1	-	6545-21-852-9429
Case, thermometer	1	-	-	6515-21-857-9045
Cotton, purified, 28.0 g	6	6	-	6510-21-116-0197
Depressor, tongue, 25's	4	-	-	6515-21-852-9427
Dressing, first aid, field	12	-	1	6510-21-102-7867
Dressing, petrolatum, 10's	1	-	-	6510-21-874-4431
Forceps, hemostatic	1	-	-	6515-21-116-4057
Forceps, splinter	1	1	-	6515-00-337-2400
Form, Field Medical Card	20	-	-	7530-21-870-5029
Halazone tablets, 100's	2	-	-	6505-21-857-6882
Litter, rigid, Stokes	1	-	-	6530-21-851-3111
Pad, cotton, eye	12	6	-	6510-21-845-2189
Pad, non-adherent, 200's	1	-	-	6510-21-845-2194
Pin, safety, 9's	4	-	-	8315-21-843-6856
Povidone-Iodine Solution	1	1	-	6505-21-857-6781
Scissors, bandage	1	1	-	6515-21-846-0206
Shield, eye, surgical	1	-	-	6515-21-116-3164
Soap, green, tincture	1	-	-	6505-21-870-6174
Splint set, wood	1	1	-	6545-21-116-2912
Sponge, surgical, 10.0 cm x 10.0 cm, 2's	12	4	-	6510-21-845-2440
Thermometer, clinical	1	-	-	6515-21-857-6956
Waste, matted yarns	1	1	-	8305-21-116-0248

\* Not stocked as a complete kit.  
Kit contents must be ordered separately.



TABLE III  
SUPPLIES FOR FIRST AID ROOMS

DESCRIPTION	QUANTITY	STOCK NUMBER (SSC)
Adhesive tape, surgical, 7.5 cm x 4.6 m	3	6510-00-203-5000
Applicator, disposable, 25's	4	6515-21-852-9428
Bag, ice, throat	1	6530-00-770-7500
Bag, hot water	1	6530-21-116-0396
Bandage, adhesive, 100's	1	6510-21-845-2239
Bandage, felt, orthopaedic	2	6510-21-116-0170
Bandage, gauze, 5.0 cm x 4.6 m	12	6510-21-116-0174
Bandage, gauze, 7.5 cm x 4.6 m	12	6510-21-116-0175
Bandage, gauze, 10.0 cm x 5.46 m	12	6510-21-849-9537
Bandage, triangular, 2's	6	6510-21-880-9702
Basin, wash	2	6530-21-846-9260
Benzalkonium Chloride Tincture	6	6505-21-852-9421
Blanket, bed, grey	2	7210-21-849-9452
Brush, scrub, nail	1	7920-21-116-2811
Cloth, coated (rubber sheeting)	2	8305-21-846-0459
Cotton, non-sterile, 0.454 kg	1	6510-21-116-0194
Cup, paper	20	7350-21-845-1041
Depressors, tongue, 25's	4	6515-21-852-9427
Dressing, first aid, field	6	6510-21-102-7867
Dressing, surgical, combination	6	6510-21-849-9539
Forceps, hemostatic	1	6515-21-116-4058
Forceps, splinter	1	6515-00-337-2400
Gloves, rubber, domestic	1	8415-21-845-9584
Gloves, surgeon	1	6505-21-877-0841
Isopropyl alcohol	1	6505-21-852-9420
Litter, folding	1	6530-21-848-4908
Medicine cup, graduated	1	6530-21-846-9540
Pad, cotton, eye	4	6510-21-845-2189
Pin, safety, 9's	2	8315-21-843-6856
Scissors, bandage	1	6515-21-846-0206
Shield, eye, surgical	4	6515-21-116-3164
Soap, surgical	1	6505-21-855-2230
Splint set, wood	1	6515-21-116-2912
Sponge, surgical, 5.0 cm x 5.0 cm, 2's	100	6510-21-845-2171
Sponge, surgical, 10.0 cm x 10.0 cm, 2's	100	6510-21-845-2440
Tray, instrument	1	6530-21-846-9818



### Application

1. This Standard applies to all Public Service departments and agencies, as defined in Part I of Schedule I of the Public Service Staff Relations Act.

### Definitions

#### 2. In this Standard

- (1) "explosive actuated tool" means a tool that is designed to be held in the hand and that is actuated by an explosive charge;
- (2) "hand tool" means a tool that is designed to be held in the hand and that is operated by manual power;
- (3) "portable power tool" means a tool that is designed to be held in the hand and that is operated by any source of power other than manual power;
- (4) "person in charge" means a qualified person appointed by management to supervise the safe and proper conduct of an operation or the work of employees.

### Design and Construction

3. To the extent that it is reasonably practicable, departments should ensure that all hand tools and portable power tools have been designed and constructed so as to be safe under all conditions of intended use.
4. Every electric portable tool used shall be of a type intended for commercial or industrial use, and certified as safe for its intended purpose by the Canadian Standards Association, or some other recognized testing agency recommended by a Regional Director of Labour Canada.
5. In any place where there is a risk that an explosive or flammable atmosphere is likely to be ignited by sparks, only those tools having an exterior surface made of non-sparking material are to be used.
6. Where an electric portable power tool is used in a hazardous location, it is to be of a type that complies with the appropriate recommendation of Part I of the Canadian Electrical Code, Canadian Standards Association standard C22.1-1975, Safety Standards for Electrical Installations, as amended from time to time.
7. Every electric portable power tool that is used shall be grounded in accordance with Part I of the Canadian Electrical Code, Canadian Standards Association standard C22.1-1975, as amended from time to time.

8. Paragraph 7 does not apply to a portable power tool that is operated by a self-contained battery, or to a portable power tool that is designed to be safe for use without grounding and has been certified by the Canadian Standards Association as safe for such use.
9. No employee shall ground an electric portable power tool described in paragraph 8 where the housing and shaft of the tool are completely insulated from its electrical components.
10. Where air hoses are connected to portable power tools, restraining devices shall be fitted on all hose connections to prevent injury to an employee in the event of the inadvertent disconnection of any hose, and a restraining device shall be fitted on a tool where a person might be injured by its falling.
11. The shaft of any flexible shaft portable power tool is to be protected from denting and kinking.
12. Every explosive actuated portable power tool used is to be designed and constructed in accordance with
  - (1) the Canadian Standards Association Safety Code for Explosive Actuated Fastening Tools, standard Z166-1975 as amended from time to time; or
  - (2) any other standard that follows good industrial safety practice and is recommended by a Regional Director of Labour Canada.

#### Operation and Use

13. All hand tools and portable power tools shall be operated and used in accordance with good industrial safety practice.
14. No employee is to use an explosive actuated tool without the approval of the person in charge and unless he possesses an operator's certificate issued by the manufacturer, or he has been trained in the use of the tool in accordance with a standard that follows good industrial safety practice.
15. An employee shall not be permitted to use a hand tool or portable power tool unless he is qualified by his knowledge, training and experience, and is authorized to do so.
16. Where necessary, a manual of operating instructions for a hand tool or portable power tool shall be readily available to any employee who is required to use that tool.
17. Where it is necessary to remove or change an attachment, or make any adjustment or repair to a portable power tool, such work shall not proceed unless the tool is disconnected from its power source in a manner that ensures that it cannot be inadvertently reconnected.

18. Employees who use a pneumatic portable power tool shall shut off the air supply to that tool and bleed the air line before disconnecting it from the tool, unless the air line is equipped with a quick disconnect coupling that makes such precautions unnecessary.
19. No person is to use a pneumatic portable power tool or air hose in such a manner that an air stream might be directed forcibly against his/her body, or the body of any other person.
20. Employees shall ensure that the tool end of any flexible shaft portable power tool is secured in a manner that will prevent the flexible shaft from whipping when the motor is started.

#### Inspection and Maintenance

21. Departments shall ensure that all hand tools and portable power tools used are inspected at regular intervals and maintained in a safe working condition in accordance with good industrial safety practice.
22. A hand tool and portable power tool inspection and maintenance plan shall be instituted by departments and a record kept of all inspections and maintenance work performed in accordance with such plan.
23. Each tool or tool accessory shall be checked by employees before use to ensure that there is no visible defect that might render it unsafe. Any such defect is to be reported promptly to the person in charge.
24. Any tool or tool accessory having a defect that might render it unsafe for use must be reported to the person in charge and the tool shall be marked or tagged and removed from service.

#### Transport and Storage

25. Hand tools or portable power tools shall be transported and stored in a safe manner.



Application

1. This Standard applies to all Public Service departments and agencies, as defined in Part I of Schedule I of the Public Service Staff Relations Act.

Definitions

2. In this Standard

- (1) "blanking off" means preventing the flow of any substance to or from a confined space by means of a solid plate that completely blocks the flow of such material, and that is not dependent for its effectiveness on a valve or similar device;
- (2) "breathing apparatus" means an approved apparatus that, in an oxygen-deficient atmosphere or an atmosphere contaminated by a toxic or dangerous substance, will provide oxygen or an adequate supply of air that is safe to breathe to a person engulfed in that atmosphere, and includes breathing apparatus approved by the United States Bureau of Mines;
- (3) "approved" means approved by Labour Canada or Health and Welfare Canada;
- (4) "hazardous confined space" means a tank, silo, storage bin, process vessel or other enclosure, not designed or intended for human occupancy, in respect of which special precautions are necessary when an employee is required to enter, to protect the employee from a dangerous atmosphere, prevent the employee from becoming entrapped in stored material, or otherwise ensure the employee's safety;
- (5) "oxygen deficiency", with respect to the atmosphere in a confined space, means a concentration of oxygen by volume in the atmosphere that is less than seventeen per cent;
- (6) "qualified person" means a person who, because of his knowledge, training and experience, is qualified to perform safely and properly a specified task where required in this Standard;
- (7) "person in charge" means a qualified person appointed to ensure the safe and proper conduct of an operation or the work of employees;
- (8) "safe level", with respect to the atmosphere of a confined space, means that the level or concentration of airborne contaminants in the atmosphere

- (a) does not exceed the maximum levels for airborne contaminants recommended by the American Conference of Governmental Industrial Hygienists in its pamphlet "Threshold Limit Values of Airborne Contaminants for 1976" and amendments thereto;
  - (b) is less than the lower limits for flammable or explosive atmospheres as may be specified in Fire Protection Engineering Standards issued by the Dominion Fire Commissioner; or
  - (c) does not exceed such other limits as may be indicated by good industrial safety practice;
- (9) "safety officer" means a person designated as a safety officer by the Minister of Labour pursuant to Part IV of the Canada Labour Code;
- (10) "ventilation equipment" means a fan, blower, induced draft or other ventilation device used to force a supply of fresh, respirable, atmospheric air into an enclosed space or to remove ambient air from such space.

#### Entry Into Hazardous Confined Spaces

- 3. No employee shall enter or be permitted to enter a hazardous confined space unless such entry is made in compliance with the requirements of this Standard, and the hazardous confined space has a manhole or other opening that affords the employee safe entry to and exit from all accessible parts of the confined space when he is wearing all protective or other equipment that may be prescribed herein.
- 4. Departments shall ensure that persons in charge take effective measures to prevent the inadvertent or accidental entry of any employee into a hazardous confined space.
- 5. Where an employee is required to enter a hazardous confined space, the hazard of the confined space shall, prior to such entry, be evaluated by a qualified person who shall set out the following in writing:
  - (1) a report of the hazard evaluation;
  - (2) the pre-entry and other procedures to be carried out with respect to the hazardous confined space; and
  - (3) the emergency and rescue procedures to be implemented in the event of a mishap in the hazardous confined space.
- 6. A copy of the hazard evaluation report and all the procedures referred to in paragraph 5, including the results of any test conducted in connection with the evaluation or immediately prior to or during each entry, shall be retained on file for as long as the evaluation and procedures are valid.



7. An employee shall not enter or be permitted to enter a hazardous confined space until he has been made aware of the hazards of such entry, advised of the precautions to be observed, and instructed and trained in the proper and safe conduct of the procedures referred to in paragraph 5.
8. In addition to the requirements of paragraph 7, the person in charge shall obtain the signature of the employee on a dated copy of the hazard evaluation report and the procedures referred to in paragraph 5, prior to the employee's first entry into a hazardous confined space.
9. Each entry by an employee into a hazardous confined space shall be observed by a person in charge and, where deemed necessary by the person in charge, a qualified person shall remain at the place of entry until the duties are completed.
10. Subject to paragraph 13, 14 and 15, no employee shall enter or be permitted to enter a hazardous confined space until
  - (1) the concentration of toxic, flammable, explosive, radioactive, infectious or other airborne dangerous substance therein is reduced to and maintained at a safe level as confirmed by a test that is conducted by a qualified person and is suitable for the hazard involved;
  - (2) any oxygen deficiency is corrected;
  - (3) any liquid in which a person may drown or any free-flowing solids in which a person may become entrapped are removed from the hazardous confined space; and
  - (4) the entry of any liquid, free-flowing solids or any dangerous substance into the hazardous confined space is prevented by disconnection, or blanking off. For any other acceptable precaution, departments are to seek the advice of the Regional Director of Labour Canada.
11. The person in charge shall ensure that
  - (1) no cleaning, painting, coating, lining, welding or other operation performed by an employee after he has entered a confined space produces a hazardous condition therein; and
  - (2) where the safety of the hazardous confined space can only be guaranteed for a limited time, any employee who enters the hazardous confined space leaves it before the expiry of the limited time.
12. The documents described in paragraph 6, including the results of any tests conducted in accordance with paragraph 10 (1), shall be readily available for examination upon request by a safety officer, or by any employee who is required to enter the hazardous confined space to which the documents or records relate.

13. Where, with respect to a hazardous confined space, it is not reasonably practicable to reduce and maintain the concentration of toxic airborne dangerous substances to a safe level or to correct an oxygen deficiency therein, or to completely remove a liquid or free-flowing solids therefrom, an employee may be permitted to enter such confined space provided that all of the following conditions are met:
- (1) he is wearing an approved breathing apparatus where there is an oxygen deficiency or an inhalable dangerous substance in the hazardous confined space;
  - (2) he is wearing a safety harness or other similar safety equipment, securely attached to a lifeline that is attached to a secure anchor outside the hazardous confined space, and controlled by an employee who is trained in the emergency and rescue procedures referred to in paragraph 5 (3), and who is provided with a suitable alarm device to summon assistance;
  - (3) the entry of material into the confined space is prevented in a manner described in paragraph 10 (4);
  - (4) additional trained employees, one or more of whom shall be the holder of a valid St. John Ambulance Standard First Aid Certificate or a first aid certificate of higher competency, are readily available in the immediate vicinity of the hazardous confined space if such employee cannot be removed without the aid of such trained employees;
  - (5) the concentration of any flammable or explosive substance is reduced to and maintained at a level below the lower flammable or explosive limit of that substance; and
  - (6) any additional special precautionary measures that may be prescribed for entry into the hazardous confined space are complied with.
14. An employee shall not undertake or be permitted to undertake rescue operations, as described in paragraph 13 (4), unless he has been trained to conduct such rescue operations and is equipped with such breathing apparatus and other equipment as may be necessary to conduct the rescue operation safely.
15. The person in charge shall, where reasonably practicable, ensure, relative to paragraph 13 (4), that breathing apparatus or a source of air that is safe to breathe is available for the use of an employee being rescued.
16. Notwithstanding the requirements of paragraph 13 (2), an employee may, without wearing a safety harness, enter a hazardous confined space containing granular or other free-flowing solids that are non-toxic and non-corrosive, for the purpose of removing such solids or for the purpose of cleaning the hazardous confined space, provided that all of the following conditions are met:

- (1) the atmosphere therein complies with the requirements of paragraphs 10 (1) and 10 (2);
- (2) all material that will flow out by means of gravity has been discharged from the confined space;
- (3) the entry of material into the confined space is prevented in a manner described in paragraph 10 (4);
- (4) the discharge opening and equipment are inoperative or are guarded so that an employee in the confined space cannot fall into the opening or be injured by the equipment; and
- (5) any accumulation of material in the hazardous confined space is not sufficient to entrap an employee who enters the confined space.

#### Ventilation Equipment

17. No employee shall enter or be permitted to enter a hazardous confined space that is dependent on ventilation equipment to provide a safe atmosphere unless
  - (1) in the event of a failure of the ventilation equipment, sufficient time will be available for the employee to escape from the confined space before the contamination of the atmosphere therein exceeds the safe level, or an oxygen deficiency occurs therein;
  - (2) the ventilation equipment is either equipped with an approved alarm, the significance of which has been demonstrated to employees concerned, or monitored by an employee concerned, or monitored by an employee who is in constant attendance on the ventilation equipment and who will sound an alarm to signal faulty operation or loss of ventilation; and
  - (3) the entry procedures referred to in paragraph 5 provide that when the appropriate alarm sounds, or there is any significant change in ventilation, every employee must leave the hazardous confined space immediately.

#### Inspection and Maintenance

18. All testing equipment, safety harnesses, lifelines, breathing apparatus, ventilation equipment and any other equipment used in connection with entry into a hazardous confined space by any employee shall be inspected, maintained and tested by a qualified person as frequently as is necessary to ensure that it is in a safe condition for use at all times, but not less frequently than is recommended by the manufacturer.
19. Departments shall ensure that a complete record is kept with respect to the inspection, maintenance and tests referred to in paragraph 18, showing

- (1) the date of the inspection, maintenance or test;
  - (2) any defects noted during the inspection or test;
  - (3) the nature of any repairs made;
  - (4) the name of the qualified person who conducted the inspection, maintenance or test; and
  - (5) the date of each use of the equipment, and the reason for or manner of its use.
20. Every record that is kept pursuant to paragraph 19 shall be readily available for examination for a period of not less than two years.
  21. The person in charge shall ensure that all equipment found to be defective in any way that significantly affects its efficiency or safety is tagged with a warning tag bearing the words "Unsafe, Do Not Use" or similar wording, and is repaired as soon as possible prior to return to service.
  22. Every employee shall visually examine any breathing apparatus, safety harness or other safety equipment that he is required to use in a hazardous confined space to ensure that, within the limits of such an inspection and before he enters a hazardous confined space, he considers it safe to use.
  23. If, as a result of the inspection referred to in paragraph 22, an employee finds that the equipment he is to use is defective, he shall
    - (1) if the defect in his opinion could be the cause of danger to himself or to any other employee, or could significantly reduce the reliability or effectiveness of the equipment, report the defect immediately to the person in charge; or
    - (2) if the defect in his opinion is not likely to be the cause of danger or a significant reduction in the reliability or efficiency of the equipment, report the defect as soon as reasonably practicable to the person in charge.
  24. Where an employee reports a defect in equipment to the person in charge in accordance with paragraph 23 (1), the employee shall not enter the hazardous confined space until the equipment has been repaired or the person in charge declares that the equipment is safe to use, whichever is the earlier.

#### Compressed Air

25. Compressed air used for breathing apparatus shall comply with Canadian Standards Association standard "Purity of Compressed Air for Breathing Purposes" Z.180.1-1973 and amendments thereto, or with a standard recommended by Health and Welfare Canada or Labour Canada.

General Requirements

1. A health unit may be established where a group of more than 750 employees on any one shift is concentrated in an area where such employees would have convenient access to a centrally located health unit. The installation of a health unit to service a lesser number of employees may be considered in certain circumstances, according to the location, type and hazards of the work, and other variable factors. Health and Welfare Canada, through its Regional Medical Services Offices, will maintain a continuous appraisal of potential health unit requirements, and make recommendations to the Treasury Board in this regard.
2. Where a Regional, Zone or Area Medical Services facility of Health and Welfare Canada is accessible to groups of employees, such facility will undertake to provide health unit and health counselling services to such employees.

Location and Facilities

3. The Department of Public Works\* is responsible for the provision of the required space for an approved health unit installation, and for the provision of adequate services (heat, light, water, etc.) as specified in this Standard. Prior to undertaking the construction or provision of such space, Public Works will consult with the Medical Services Branch of Health and Welfare Canada, in Ottawa, or the nearest Regional Director of Medical Services, concerning the proposed site, the layout of space and the facilities to be installed.
4. In situations where a health unit is installed to service a group of employees located in separate buildings in an area, the health unit should be so located that the average distance from the workplaces of all the groups of employees to be served is as short as possible.
5. A health unit should be located in a conveniently accessible and central location within a building, preferably near a passenger elevator, in order to facilitate handling accident or stretcher cases. The location should be free of irritating noise, dust, odours and vibrations. Doorways should be at least 36" (90 cm) wide to accommodate stretchers and wheelchairs.
6. Proper ventilation, illumination, heating, telephone communications, water and toilet facilities are to be provided.

\*Departments having the control and management of their own space and facilities are required to assume the functions assigned in this Standard to the Department of Public Works.

7. The location of the health unit should be identified through the provision of appropriate signs and directions, both at the unit, and throughout the area served.

#### Space Requirements

8. Total health unit space should be provided on the basis of 625 square feet ( $56.25\text{m}^2$ ) for the first 750 employees served, and an additional 25 square feet ( $2.25\text{m}^2$ ) for each 50 additional employees. Such space will include the following:

##### Waiting Room

- (1) Each waiting room should contain adequate waiting spaces and furnishings for four (4) persons for each 750 employees served. The layout should allow sufficient space to permit the turning of a stretcher for entrance into the treatment room and quiet rooms.

##### Treatment Rooms

- (2) Treatment rooms should contain adequate lockable cupboard space, a suitable wall cupboard over the sink, and counter space.

##### Counselling Offices

- (3) A counselling office will be provided for each nurse. Such offices should be as soundproof as possible, immediately accessible to the waiting room and contain built-in bookshelves or a bookcase.

##### Quiet or Rest Rooms

- (4) Two quiet rooms will be installed in each health unit, each with space for two cots. Overhead tracks should be installed with suitable curtains to surround each cot.

##### Washroom and Toilet Facilities

- (5) These facilities should be located adjacent to the treatment room wherever possible.

##### Storage Space

- (6) A separate storage area with built-in shelving for linen supplies, etc., will be provided.

#### Furnishings and Equipment

9. Medical furnishings, supplies and equipment shall be supplied by Health and Welfare Canada. Other furnishings shall be supplied by the department receiving service from the health unit. Where more than one department is served, co-operative arrangements for the supply of furnishings may be made between the host departments. A list of furnishings, supplies and equipment is contained in Table I.

### Nursing Counsellors

10. A qualified nursing counsellor will be in charge of each health unit. Additional nursing personnel may be assigned where necessary, to staff a health unit in accordance with the scale of one nursing counsellor for each 750 employees on a shift. Where a lesser number of employees work on another shift, provision of nursing services may be considered for that shift, according to the requirements of each situation.
11. Where a group of temporary or casual employees is to be engaged for a period of two weeks or more and the addition of such staff in an area serviced by a health unit constitutes, according to this Standard, a requirement for an additional nurse, the department employing such temporary staff may, giving adequate notice, request Health and Welfare Canada to provide the temporary services of additional nursing personnel for the duration of such period.
12. The nursing personnel of each health unit will be appointed by Health and Welfare Canada and the nursing staff and health unit will operate under the exclusive direction and control of that department.
13. A nursing counsellor in charge of a health unit will be responsible for all aspects of its operation, and in this respect will report direct to the Regional, Zone or Area Director of Medical Services of the area in which the health unit is located. The role of the nursing counsellor is outlined in Table II.

### Records

14. The provision, maintenance, use and interpretation of all records, forms and procedures as may be required in the operation of a health unit, and for nursing counsellor services, will be the responsibility of Health and Welfare Canada.

TABLE I  
SUGGESTED LIST OF SUPPLIES AND EQUIPMENT FOR  
PUBLIC SERVICE HEALTH UNITS

ITEMS PROVIDED BY HOST DEPARTMENT

Nurse's Office

Desk, double pedestal, 60" x 30" (150cm x 75cm).  
Chairs (2), straight, without arm rests, upholstered.  
Chair (1), straight, with arm rests, upholstered.  
Cabinets, filing, letter size, 4 drawers with lock, (one for each 400 employees served) including 8 file compressors for each cabinet.  
Costumer (1).  
Fan, electric desk, (for non air-conditioned areas only).

Waiting Room

Settee(s), upholstered.  
Table(s), end.  
Chairs, with arm rests, upholstered.  
Costumer.  
Pamphlet Rack (specifications available from Medical Services Branch, Health and Welfare Canada).

Quiet Rooms

Chairs, straight, wooden, without arm rests.  
Mirrors, wall.  
Costumers.  
Fan, electric desk (non air-conditioned areas only).

Treatment Rooms

Chairs, straight, wooden, without arm rests.  
Fan, electric desk (non air-conditioned areas only).  
Refrigeration Unit, 4.6 cu. ft. (0.138m<sup>3</sup>) capacity (approximately).

ITEMS PROVIDED BY HEALTH AND WELFARE CANADA

All medical supplies and equipment required for the operation of a standard health unit will be determined and provided by Health and Welfare Canada. A detailed list of such supplies and equipment is available from the Medical Services Branch of that department.

Health units servicing operations having special health risks, such as laboratories, etc., may carry special additional supplies and equipment. Requests for the provision of such supplies will be made through the Medical Services Branch of Health and Welfare Canada.



TABLE II

THE ROLE OF THE PUBLIC SERVICE NURSING COUNSELLOR

MEDICAL SERVICES BRANCH, HEALTH AND WELFARE CANADA

The Public Service Nursing Counsellor fulfils a key role in the operation of the Public Service Health Program. The Counsellor's prime function is to undertake an active program of health counselling designed to foster in employees the knowledge to promote their own and their families' good health. Subjects which may be involved in such activities include personal health and hygiene, emotional health, problem drinking, nutrition, home food budgeting, recreation, home and family problems, maternal and child health, job adjustment and vocational guidance, excessive absenteeism and work environment. The nursing counsellor also provides an advisory service to departmental management in all matters concerning the occupational health and well-being of employees.

The nurse is familiar with, and makes full use of, community medical resources for the benefit of the employee, and may refer employees, where appropriate, to a personal physician, a Public Service Medical Officer, or to community agencies such as mental health services, child health agencies, family welfare, rehabilitation centres for alcoholism and drug abuse, etc.

The nurse participates, where required, in the local administration of environmental health programs, and may advise management concerning the need for supervision or control of occupational or environmental hazards which may come to his or her attention. The nurse is also concerned with the general medical supervision of sanitary conditions, including the provision of advice and instruction to employees in proper food-handling techniques, and is also prepared to participate in the activities of local safety committees.

Emergency medical and nursing care is provided by the nurse in cases of occupational illness and injuries. In other illnesses or injuries, limited medical care may be provided to employees until they can be treated by a personal physician. Other than the foregoing, the provision of special care and treatment may be considered, if resources permit, upon written request from the employee's private physician.

The nurse may, where required, assist management in defining local requirements for provision of employees trained in first aid, in the selection of employees for such training, and in monitoring the qualifications and effectiveness of those administering first aid.

The Nursing Counsellor may assist with arrangements for, and participate in, the provision of employee medical examinations, and the immunization of employees prior to foreign duty, isolated posting, or other occasions. The nurse also participates in the planning, organization and implementation of special programs such as mass X-ray surveys or immunizations, promotes departmental arrangements for "return-to-work" interviews with employees following absences due to illness or injury, and with new employees reporting to work.



Application

1. This Standard applies to all Public Service departments and agencies, as defined in Part I of Schedule 1 of the Public Service Staff Relations Act.

Definitions

2. In this Standard

- (1) "machine guard" means a device that is installed on a machine to prevent a person, or any part of his body or clothing, from becoming engaged in any rotating, moving, electrically charged, hot or other dangerous part of a machine, or the material that the machine is processing, transporting or handling. It also means a device that makes the machine inoperative if a person or any part of his clothing is in or near a part of the machine that can cause injury;
- (2) "person in charge" means a qualified person appointed by management to supervise the safe and proper conduct of an operation or the work of employees;
- (3) "safety officer" means a person so designated by the Minister of Labour pursuant to Part IV of the Canada Labour Code.

General Requirements

3. To the extent that is reasonably practicable, departments should ensure that all machines used by employees are designed, constructed and installed so as to be safe without the use of removable machine guards.
4. Machine guards shall be installed on any machine or part of a machine that constitutes a source of danger to personnel, and shall be maintained in such a manner as to ensure safe and proper operation of the machine.
5. An employee shall not be permitted to operate, or perform any maintenance or repair work on a machine guard, unless he is qualified by knowledge, training and experience, and is authorized to do so.
6. Where a machine or a part thereof is equipped with a machine guard, the machine or a part thereof shall not be operated or used unless the machine guard is in its proper position, except in an emergency situation or following consultation with the appropriate Regional Director of Labour Canada.

## Repair and Maintenance of Machines

7. Where a machine or part thereof has a machine guard that must be removed from its protective position in order to perform repair or maintenance work, such work may not proceed unless the machine or part thereof has been made inoperative, and the work is performed in accordance with a lock-out procedure, i.e. a written procedure approved by the person in charge that will ensure that the machine cannot be operated or energized without the knowledge and consent of the person performing the repair or maintenance work on the machine, where such work would expose that person to danger.
8. Where a machine or a part thereof has a machine guard described in paragraph 7, and it is not reasonably practicable to render the machine or the part inoperative in order to perform repair or maintenance work, such work may be performed on the machine if
  - (1) the person performing such work follows a special written procedure that is consistent with good industrial safety practice, and which will ensure that the danger to the safety of that person is not significantly greater than it would be if the machine or part thereof had been rendered inoperative; and
  - (2) prior to the performance of such work, written authority is obtained from the person in charge; and
  - (3) such work is performed in the presence of and under the direct supervision of the person in charge, or a qualified person authorized by the person in charge.
9. Departments should ensure that a copy of every written procedure referred to in paragraphs 7 and 8 is readily available to persons who repair and maintain machines, and for examination by a safety officer.

## Standards for Machine Guards

10. Every machine guard is to be designed, constructed, installed, operated and maintained in accordance with a standard set out in the attached Table or a standard that follows good industrial safety practice. In the latter case, departments should seek the advice of the appropriate Regional Director of Labour Canada.

TABLE I  
MACHINE GUARD STANDARDS

<u>Standard</u>	<u>Title</u>
(1) <u>Canadian Standards Association</u>	
a) CSA Z142-1976*	"Code for the Guarding of Punch Presses at Point of Operation"
b) CSA Z114-1977*	"Safety Code for the Woodworking Industry"
c) CSA B.173.5-1972*	"Safety Code for Use, Care and Protection of Abrasive Wheels"
(2) <u>American National Standards Institute, Inc.</u>	
ANS B15-1-1953 (R1958)*	"Safety Code for Mechanical Power-Transmission Apparatus"
(3) <u>Her Majesty's Factory Inspectorate</u> (Safety, Health and Welfare Booklets)	
a) New Series No. 3*	"Safety Devices for Hand and Foot Operated Presses"
b) New Series No. 11*	"Guarding of Hand-Fed Platen Machines"
c) New Series No. 12*	"Drop-Forging Hammers, Props and Catches"
d) New Series No. 14*	"Safety in the Use of Mechanical Power Presses"
e) New Series No. 20*	"Drilling Machines"
f) New Series No. 33*	"Safety in the Use of Guillotines and Shears"
(4) <u>National Safety Council</u>	
Accident Prevention Manual (7th Edition)*	

\* As amended from time to time



Application

1. This Standard applies to all Public Service departments and agencies, as defined in Part I of Schedule I of the Public Service Staff Relations Act.

Definitions

2. In this Standard

- (1) "Act" means Part IV of the Canada Labour Code;
- (2) "maximum safe load", with respect to any materials-handling equipment or any floor, dock or other structure used in handling materials, means
  - (a) the maximum load that such equipment or structure was designed and constructed to handle or support safely; or
  - (b) the maximum load that such equipment or structure is guaranteed or specified in writing by the manufacturer to handle or support safely, whichever is the lesser;
- (3) "materials-handling equipment" means any machine, equipment or mechanical device used when transporting, lifting, moving or positioning any materials, goods, articles, persons or things and includes any crane, derrick, loading tower, powered industrial truck, handtruck, conveyor, hoist, earth-moving equipment, rope, chain, sling, dock, ramp, storage rack, container, pallet and skid; but does not include elevating devices that are subject to the Elevating Devices Safety Standard, TB STD 3-4, or tools that are subject to the Hand Tools and Portable Power Tools Safety Standard, TB STD 3-6;
- (4) "Minister" means the Minister of Labour;
- (5) "mobile equipment" means any materials-handling equipment described in paragraph 3 that is self-propelled, or in respect of which mobility is the predominant characteristic;
- (6) "motor vehicle" means a truck, tractor, trailer, semi-trailer, automobile, bus or other similar self-propelled vehicle used primarily for transporting personnel and/or material;
- (7) "operator" means a person who has the qualifications described in paragraph 5 and who has been designated to operate or assist in the operation of materials-handling equipment;

- (8) "person in charge" means a qualified person appointed to supervise the safe and proper conduct of an operation or of the work of employees;
- (9) "qualified person" means a person who, because of knowledge, training and experience, is qualified to perform safely and properly a specified job;
- (10) "safety officer" or "regional safety officer" means a person so designated by the Minister of Labour pursuant to Part IV of the Canada Labour Code;
- (11) "signalman" means a qualified person designated by a person in charge to direct, by means of hand, voice or other signals, the safe movement or operation of materials-handling equipment;
- (12) "standard code of signals" means a code of signals that
  - (a) is adopted by a department for use by all employees in directing the safe movement or operation of materials-handling equipment; and
  - (b) complies with the code of signals recommended by the National Safety Council or by the American National Standards Institute.

#### General Responsibility of Departments

- 3. Departments shall ensure, to the extent that is reasonably practicable, that all materials-handling equipment, floors, docks or other structures that are operated or used for handling materials
  - (1) are suitable and safe for the purposes for which they are operated or used;
  - (2) are maintained in a safe operating condition; and
  - (3) comply with this Standard.
- 4. The operator of any materials-handling equipment shall have ready access to such operating manuals as may be necessary for the safe and proper operation of the materials-handling equipment. The operator shall also have access to relevant maintenance schedules and will ensure that, where required, operator maintenance is performed according to such schedules.
- 5. Every operator shall be
  - (1) appropriately trained, instructed and tested in the safe and proper use of the applicable materials-handling equipment, and be familiar with departmental safety directives;



- (2) physically fit to safely operate materials-handling equipment; and
  - (3) familiar with the highway vehicle laws of every province and territory within which mobile equipment is operated during the course of employment.
- 6. A record shall be maintained of any training and instruction provided pursuant to paragraph 5 (1).
  - 7. Subject to paragraph 76, no employee shall be permitted to operate or assist in the operation of any materials-handling equipment unless the employee has either been authorized as an operator, or is an employee engaged in maintaining or repairing materials-handling equipment and is required under the authority of the person in charge to operate such equipment for purposes of testing, ascertaining fault or verifying repairs.
  - 8. Where, in the opinion of a Labour Canada Regional Director, a code, procedure or practice referred to in this Standard, or utilized by a department, does not provide a sufficient degree of safety or may be otherwise inappropriate, the Director may, in accordance with the procedures outlined in the Occupational Safety Policy for the Public Service, make recommendations to departments concerning the specific safety procedures or codes to be followed in the circumstances. Departments may obtain information and/or advice concerning good industrial safety practice or applicable safety codes or procedures by contacting the appropriate Regional Office of Labour Canada.

#### General Responsibility of Employees

- 9. Every operator shall operate any materials-handling equipment assigned in the manner in which the operator was trained and instructed as stipulated in paragraph 5 (1).
- 10. No operator shall operate any materials-handling equipment in a careless or reckless manner or otherwise endanger his or her safety or that of other employees.
- 11. No operator shall operate or use any materials-handling equipment from which a machine guard or other safety device has been removed or rendered ineffective except in accordance with the Machine Guarding Safety Standard, TB STB 3-9.
- 12. No employee shall interfere with the safe operation of any materials-handling equipment.
- 13. No employee shall remove or render ineffective a machine guard or other safety device with which any materials-handling equipment is fitted except with the express approval of the person in charge.

## DESIGN AND CONSTRUCTION OF MATERIALS-HANDLING EQUIPMENT

### General

14. Materials-handling equipment required to be operated or used by an employee shall be designed, constructed, operated and used in a manner such that
  - (1) the equipment will perform safely under the severest conditions of its operation and use that are likely to be encountered;
  - (2) to the extent that is reasonably practicable, all parts of the equipment that are subject to failure are so designed that, if a failure occurs, it will not result in a loss of control of the equipment or otherwise create an unsafe condition;
  - (3) all glass in doors, windows and other parts of the equipment is safety glass that will not shatter into sharp and dangerous pieces under impact;
  - (4) any equipment employed directly in the loading and unloading of ships complies with the Tackle Regulations made under the Canada Shipping Act; and
  - (5) it conforms to the applicable requirements of the Canada Motor Vehicle Safety Standards prescribed by Transport Canada.

### Protection from Falling Objects

15. Where materials-handling equipment is used under such circumstances that the operator may be struck by a falling object or shifting load, the materials-handling equipment shall be provided with a protective cab, roof, screen, bulkhead or guard of a design, construction and strength that will prevent, under all foreseeable conditions, the penetration of the object or load into the area occupied by the operator.
16. A protective device referred to in paragraph 15 shall be
  - (1) fabricated from non-combustible or fire-resistant material; and
  - (2) designed to permit quick exit from the materials-handling equipment in an emergency.
17. Paragraph 15 does not apply where a protective device referred to therein would interfere with the effective operation of the materials-handling equipment and a procedure or method is used that, in the opinion of the person in charge, will protect the operator from a falling object or shifting load.

### Protection from Turnover

18. Where mobile equipment is likely to turn over under any circumstances of its use, it is to be fitted with roll-over bars or a similar protective device that will prevent the operator of the mobile equipment from being trapped or crushed under the equipment if it does turn over.

### Fuel Tanks

19. Any fuel tank, compressed gas cylinder or similar container of a dangerous substance that is mounted on any materials-handling equipment is to be
  - (1) located or protected so that, under all conditions, it constitutes a minimal hazard to any employee who is required to operate or ride on that equipment and, in the case of a fuel tank, is separated from the operator by an adequate protective shield or partition;
  - (2) connected to fuel overflow and vent pipes that are located so that fuel spills and vapours cannot be ignited by hot exhaust pipes or other hot or sparking parts, or otherwise endanger the safety or health of any employee who is required to operate or ride on that equipment; and
  - (3) labelled on servicing caps or covers as to the contents of each tank.

### Protection from Elements

20. The operator of any materials-handling equipment regularly used out of doors is to be protected from exposure to any condition that will, in the opinion of the person in charge, jeopardize safety or health.
21. Where the temperature in the operator's compartment or position on any materials-handling equipment is, as a result of heat coming from or associated with the equipment, normally and consistently above 80°F (26°C), the operator shall, to the extent that is reasonably practicable, be protected from the heat by an insulated barrier or some other effective means.

### Vibrations

22. All materials-handling equipment operated by any employee is to be so designed and constructed that the operator will not be injured, or control of the equipment be impaired, by any vibrations, jolting or uneven movements of the equipment under normal operating conditions.
23. Any protection provided in accordance with paragraph 22 shall, to the extent that is reasonably practicable, be an intrinsic part of the design and construction of the materials-handling equipment.

### Controls

24. The arrangement and design of dial displays and controls, and the general layout and design of the operator's compartment or position on all materials-handling equipment shall
- (1) contribute to the safe operation of the materials-handling equipment; and
  - (2) not hinder or prevent the operator from operating the materials-handling equipment in accordance with good industrial safety practice.

### Fire Extinguishers

25. Fire extinguishers are to be provided in accordance with Fire Protection Engineering Standards published by the Dominion Fire Commissioner.

### Means of Entry or Exit

26. All materials-handling equipment operated or maintained by an employee is to be provided with a safe means of entry into and exit from
- (1) the compartment or position of the operator; and
  - (2) any place on the equipment in which an employee must be positioned in order to service the equipment.

### Tool Boxes

27. Tools, materials or parts carried on any materials-handling equipment shall be stored in a tool box or other secure and safe place where they will not endanger the operator or any other person.

### Lighting

28. Where any mobile equipment is operated or used by an employee at night, or in areas where the illumination level within the area of operation of the equipment is less than one foot candle (one decalux), the mobile equipment is to be
- (1) fitted on the front and rear thereof with warning lights that are visible at night from a distance of not less than three hundred feet (one hundred metres); and
  - (2) provided with general illumination sufficient to ensure the safe operation of the equipment under all conditions of use.
29. Where the general illumination referred to in paragraph 28 (2) is provided by lighting facilities on the mobile equipment, the lighting facilities shall comply with paragraphs 30 and 31.

30. Notwithstanding paragraph 28, no operator shall operate any mobile equipment at night on a road that is used by other vehicles unless it is equipped with such lighting facilities for mobile equipment as are prescribed by the laws of the province or territory in which the equipment is operated.
31. Where lighting facilities for mobile equipment are not prescribed by a law of the province or territory in which the equipment is operated, the lighting facilities on that equipment shall comply with Canadian Standards Association standard Vehicle Lighting Equipment, D106-1-1972, as amended from time to time, or such other standard recommended by Labour Canada.

#### Slow-moving Vehicles

32. Mobile equipment operated at a rate of speed that is more than twenty miles per hour (thirty kilometres per hour) below the posted speed for the road or area being utilized shall be equipped with a slow-moving vehicle warning device as prescribed by the laws of the province or territory in which the equipment is operated.
33. Where the laws of the province or territory in which the mobile equipment is operated do not prescribe a slow-moving vehicle warning device, such mobile equipment shall be equipped with a warning device in accordance with Canadian Standards Association standard Slow Moving Vehicles Warning Device, D198-1967, as amended from time to time.

#### Safe Loads

34. Materials-handling equipment shall not be operated or used with a load that is in excess of its maximum safe load.
35. The failure of any materials-handling equipment due to overloading may create an unsafe work condition; therefore
  - (1) the maximum safe load of that equipment shall be clearly marked on the equipment or on a label securely attached to a permanent part of the equipment in a position where the mark or label can be easily read by the operator, and such mark or label shall be maintained in a legible condition; and
  - (2) where appropriate, equipment shall be provided with a diagram securely attached to a permanent part of the equipment, showing the lift capacity at each attitude and length of the boom or other lifting member.
36. Notwithstanding paragraph 35, the labelling of chains, ropes and slings may be waived if some other means of determining their safe loads is readily available to all employees required to use them, and procedures are adopted that will ensure that the safe loads are not exceeded.

### Control Systems

37. All mobile equipment that is operated or used is to be fitted with braking, steering and other control systems that
  - (1) are capable of safely controlling and stopping the movement of the mobile equipment and any hoist, bucket or other part thereof; and
  - (2) respond positively, reliably and quickly to moderate effort on the part of the operator.
38. Where, in the opinion of the responsible departmental officer, it is necessary for safety,
  - (1) power-assisted systems are to be provided for the braking, steering or other control systems of the mobile equipment; and
  - (2) an alternate power source for braking and steering is to be provided on equipment that cannot be controlled safely by an operator in the event of engine failure.
39. Any mobile equipment frequently used for transporting employees as passengers from place to place on a work site is to be equipped with a mechanical parking brake as well as a hydraulic or pneumatic braking system.
40. Where any materials-handling equipment has a moving part with a limit as to safe operating speed or safe travelling distance, an automatic control shall be provided for that part, where reasonably practicable, to prevent its speed or distance of travel, as the case may be, from exceeding that limit.

### Starting Devices

41. Where it is reasonably practicable to do so, all mobile equipment that is operated or used shall be fitted with a power-operated starting device.
42. No operator of any mobile equipment that is fitted with a power-operated starting device shall use a hand crank to start the equipment unless the starting device fails.
43. When the starting device referred to in paragraph 41 fails, it shall be restored to service as soon as is reasonably practicable.

### Warnings

44. Any mobile equipment that operates in any area occupied by employees is to be fitted with a horn or similar audible warning device, having a distinctive sound that can be clearly heard above the noise of the equipment and any surrounding noise. Where audible warning devices do not provide adequate warning, visual flashing signals such as strobe lights shall be used.

### Seat Belts

45. Any mobile equipment, operated or used under conditions where safety seat belts or shoulder-type restraining devices are likely to contribute to the safety of the operator, shall be fitted with such seat belts or device.
46. The safety seat belts referred to in paragraph 45 shall comply with Canadian Standards Association standard Seat Belt Assemblies for Passenger Cars, Multipurpose Passenger Vehicles, Trucks and Buses, D159.1-1972, as amended from time to time.
47. Every employee, while travelling on any mobile equipment that has been fitted with safety seat belts or a shoulder-type restraining device, shall use or wear such seat belts or device.

### Rear View Mirror

48. Where mobile equipment cannot be operated safely unless the operator has a clear view of the area behind the vehicle or equipment, such vehicle or equipment is to be equipped with sufficient mirrors to provide a clear view of the rear.

### Electrical Equipment

49. Any electrically powered materials-handling equipment shall be so designed and constructed that the operator or any other person will be protected from electrical shock or injury by means of securely fastened protective guards, screens or panels.

### Automatic Equipment

50. Any mobile equipment, controlled or operated by a remote or automatic system, and used in any place where it may make dangerous contact with any employee, is to be prevented from making such contact, to the extent that is reasonably practicable.
51. Where it is not reasonably practicable to comply with paragraph 50, at every dangerous intersection or place along the roadway or path of travel of any mobile equipment referred to therein, the safety of employees is to be protected by an alarm system, an emergency stop system and protective barriers.

### Docks and Ramps

52. Every loading and unloading dock, platform and ramp used by any employee is to be
  - (1) of sufficient strength to support, without failure, the maximum load to which it will be subjected;

- (2) generally free of surface conditions and irregularities that may interfere with the safe control of mobile equipment;
  - (3) fitted, around any of its sides that are not used for loading or unloading, with side rails, bumpers or rolled edges of sufficient height and strength to prevent mobile equipment from running over the edge; or
  - (4) used in a manner that will avoid mobile equipment from running over the edge.
53. Every portable ramp or dock plate used by any employee is to be
- (1) clearly marked or tagged to indicate its maximum safe load; and
  - (2) provided with a means of attaching it firmly and securely in place, except where it is so designed that it cannot slide, move or otherwise be displaced under the load that it is required to support.
54. Paragraph 53 (1) does not apply where
- (1) some means of establishing the safe load of a portable ramp or dock plate, other than that described in that paragraph, is available to all employees required to use such ramp or plate; and
  - (2) procedures are adopted which will prevent the maximum safe load of the portable ramp or dock plate from being exceeded.
55. No operator shall operate or be permitted to operate any mobile equipment on a ramp with a gradient in excess of
- (1) the gradient that is recommended as safe for that type of ramp by the manufacturer of the mobile equipment, either loaded or unloaded, as applicable;
  - (2) such lesser gradient as is safe in the opinion of the person in charge, with regard to the mechanical condition of the mobile equipment and its load and traction.

#### Conveyors

56. Each conveyor, cableway or other similar materials-handling equipment that is operated, used or serviced by any employee is to be designed, constructed, operated and maintained in accordance with American Society of Mechanical Engineers standard B20.1 (1957), as amended from time to time, or with a standard recommended by Labour Canada.
57. Where a conveyor, cableway or other similar materials-handling equipment crosses a roadway or walkway at ground or floor level, and there is a danger that such equipment could come into contact with a person or a



vehicle, a safe passageway for such person or vehicle, as the case may be, is to be provided.

58. Where a conveyor, cableway or other similar materials-handling equipment crosses above a roadway, walkway or work area used by employees, the equipment is to be so guarded that material from the equipment cannot fall on any person or vehicle passing underneath it.
59. Where a "go-slow" sign, restricted clearance sign or other warning sign is placed at a conveyor cross-over for the safety of employees, the approaches to such a cross-over shall be clearly marked at a safe distance from the cross-over with an appropriate warning sign.

#### Clearance

60. Subject to paragraphs 63 and 64, the person in charge shall ensure, on any route that is regularly travelled by mobile equipment operated or used by any employee, that clearances are provided that comply with paragraph 61.
61. Every clearance referred to in paragraph 60 shall
  - (1) in the case of an overhead clearance, be at least six inches (150 mm) above that part of the mobile equipment or its load that is highest when the mobile equipment is in its highest operating position at the point of clearance; and at least six inches (150 mm) above the top of the head of every employee authorized to ride on the mobile equipment, when the employee is occupying the highest position at the point of clearance; and
  - (2) in the case of a side clearance, be adequate to permit the mobile equipment and its load to be manoeuvred safely by an operator, but in no case less than six inches (150 mm) on each side measured from the farthest projecting part of the equipment or its load, when the equipment is being operated in a normal manner.
62. If an overhead clearance measured in accordance with paragraph 61 (1) is less than twelve inches (300 mm), the top of the doorway or object that restricts the clearance shall be marked with a distinguishing colour or mark; and the height of the passageway in feet (metres) shall be shown near the top of the passageway in letters that are not less than two inches (50 mm) in height and are on a contrasting background.
63. Paragraphs 61 (2) and 62 do not apply to
  - (1) any mobile equipment whose course of travel is controlled by fixed rails or guides;
  - (2) that portion of the route of any mobile equipment that is inside a railway car, truck or trailer truck, including the doorway of the car, truck or trailer truck and the warehouse doorway leading directly thereto; or

- (3) a load that is larger than that normally transported by mobile equipment, if such a load is transported infrequently and special precautions are taken to prevent contact with objects that might restrict the movement of the equipment.
64. Where it is not reasonably practicable to provide a clearance prescribed by paragraph 61 and, in the opinion of the person in charge, a lesser clearance would not be dangerous, such lesser clearance may be allowed.

#### Aisles and Corridors

65. Where an aisle, corridor or other course of travel which exceeds fifty feet (15 m) in length is a principal traffic route for pedestrians and mobile equipment, a clearly marked walkway not less than thirty inches (750 mm) wide shall be provided along one side of the route, for the use of pedestrians only.
66. Paragraph 65 does not apply where measures other than those described therein are adopted for the purpose of controlling traffic and protecting pedestrians, and such measures comply with good industrial safety practice.
67. Where an aisle, corridor or other course of travel that is a principal traffic route intersects another such aisle, corridor or course of travel and, in the opinion of a responsible departmental officer, such intersection is dangerous,
- (1) warning signs marked with the words "Dangerous Intersection - Croisement dangereux" or similar words in letters not less than two inches (50 mm) in height on a contrasting background are to be posted along the approaches to the intersection; and,
  - (2) to the extent that is reasonably practicable, every blind corner is to be provided with mirrors in such manner that an operator of any mobile equipment that is approaching the corner along one course of travel can see a pedestrian or vehicle approaching the intersection along the other intersecting course of travel.

#### Ropes, Chains and Slings

68. Subject to this Standard, the design and construction of any rope, chain or sling and of any fittings and attachments thereon that are used by any employee shall comply with the recommendations contained in the 7th Edition of the Accident Prevention Manual of the National Safety Council, as amended from time to time.
69. Notwithstanding paragraph 68, any steel wire rope intended for use as materials-handling equipment by any employee shall comply with

- (1) the recommendations of the manual referred to in paragraph 68;
- (2) the recommendations of Canadian Standards Association standard, G4-1976, Steel Wire Rope for General Purpose and for Mine Hoisting and Mine Haulage, as amended from time to time; or
- (3) any other standard recommended by Labour Canada.

#### OPERATION, USE AND MAINTENANCE OF MATERIALS-HANDLING EQUIPMENT

##### Inspections and Checks

70. Before any materials-handling equipment is operated or used for the first time, it is to be inspected and tested by a qualified person in accordance with the requirements of the department and the operating and maintenance manuals for that equipment, to determine, to the extent that is reasonably practicable, whether it is in a safe operating condition and is suited to the purpose for which it is to be used.
71. Following the inspection and test referred to in paragraph 70, a safety and maintenance check of all materials-handling equipment is to be made by a qualified person as frequently as is necessary to ensure the safe operation of the equipment.
72. Where, in the opinion of a responsible departmental official, good safety practice requires that a safety and maintenance check schedule is to be provided and maintained for all materials-handling equipment, such schedule shall be compiled and shall show
  - (1) the equipment checked;
  - (2) the date of the check;
  - (3) the nature of the check; and
  - (4) the maintenance work performed on the equipment.
73. A copy of each schedule referred to in paragraph 72 shall be retained on file for at least one year at the location where the materials-handling equipment is maintained and shall be readily available for examination.
74. Every operator who has been assigned any materials-handling equipment shall, immediately before placing that equipment in operation for the first time on a shift, make a visual inspection of that equipment and such other inspection of it as may be directed by the person in charge in order to ensure, to the extent that is possible from such inspection, that the equipment is safe for operation.

75. Every operator referred to in paragraph 74 shall, as soon as is reasonably practicable, report and document in writing to the person in charge any defect or condition in any materials-handling equipment that it is believed will affect the safe operation of the equipment that is required to be operated, and if any such defect or condition constitutes imminent danger, the operator shall not operate the materials-handling equipment until it has been examined by the person in charge and been declared to be safe to operate.

#### Operators

76. For the purpose of training, an employee who is not an operator may be permitted to operate materials-handling equipment if that employee is accompanied by a qualified operator who can take over control of the equipment in the case of an emergency.
77. An operator who, in the opinion of the person in charge, appears to be suffering from a physical condition that may suddenly incapacitate him or her, or appears to have some other disability that may affect the ability to safely steer or otherwise safely operate the materials-handling equipment that has been assigned, shall not be permitted to operate the materials-handling equipment until it has been determined through a medical assessment arranged in accordance with the Periodic Health Evaluations Standard, TB STD 3-13, that the operator is free of any condition or disability which would render him or her incapable of operating that equipment safely.
78. If a law of the province or territory requires that the operator of a certain type of materials-handling equipment possess an operator's licence, no operator shall operate or be permitted to operate that type of materials-handling equipment unless he or she possesses the operator's licence required by that law.
79. Paragraph 78 does not apply in respect to an operator who has successfully passed an appropriate competency test, conducted by or on behalf of a department, and is in possession of a valid permit or authority issued by the department to operate the equipment for which he or she was tested, providing such operation is restricted to the department's premises.
80. Subject to paragraph 79, no operator shall operate any mobile equipment from other than the operator's regular position, or another position designed specifically for that purpose.
81. Mobile equipment may, however, be operated from a position other than one referred to in paragraph 80, where the control of the equipment and the view of the work area from that position is at least as good and as safe as from the operator's regular position on that equipment, and such position is approved by the person in charge.

82. Operators shall not operate any mobile equipment unless they

- (1) have a clear and unobstructed view of the work area and the course to be travelled; or
- (2) are under the direction of a signalman and have the approval of the person in charge.

#### Repair

83. The results of any repair, modification or replacement of a part of any materials-handling equipment that is operated or used by any employee shall not decrease the safety factor and integrity of the equipment or part.
84. If a part of lesser strength or quality than the original part is used in the repair, modification or replacement of a part of any materials-handling equipment, the use of the equipment is to be restricted to such loading and use as will ensure the retention of the original safety factor and integrity of the equipment or part.
85. For the purposes of paragraphs 83 and 84, "integrity" means the ability of any materials-handling equipment or part thereof to retain all of those qualities that are essential to its safe and reliable performance.

#### Combination of Equipment

86. Mobile equipment shall not be operated or used in an assembly or a combination with other materials-handling equipment, unless the safety of that assembly or combination is at least equal to that required by this Standard for the separate parts of the assembly or combination in respect of braking, steering and general operating control and safety.

#### Passengers

87. Subject to paragraph 88, unless authorized by the person in charge, no employee other than the operator and his or her assistants shall ride or be permitted to ride on any mobile equipment or any part thereof, or on any material transported thereon unless the mobile equipment is specifically designed for the transport of passengers.
88. A trainee operator or a person inspecting or testing any mobile equipment may accompany the operator if a secure seat or other safe place is provided on the mobile equipment.

#### Loading and Maintenance While in Motion

89. No employee shall pick up from, or place upon, any mobile equipment any materials or supplies while the mobile equipment is in motion, unless the mobile equipment is specifically designed for that purpose.

90. Except in the case of an emergency, no employee shall get on or off any mobile equipment while it is in motion.
91. No employee shall perform any repairs, maintenance or cleaning work on any materials-handling equipment while it is being operated, except on those fixed parts of the equipment that are so isolated or protected that the operation of the equipment does not affect the safety of the employee performing the repairs, maintenance or cleaning work.

#### Starting Precautions

92. No employee shall start the power unit of any materials-handling equipment until all drive clutches have been disengaged, all brakes set and the operator is assured that no person will be endangered by the starting of the power unit.
93. Where the power unit of any materials-handling equipment operated or used by any employee cannot be started from the operator's position, specific procedures or safeguards are to be employed that will prevent the accidental movement of the equipment during the starting of the power unit.

#### Unattended Equipment

94. Subject to paragraphs 95 and 96, all mobile equipment that is operated by any employee is to be shut down during any period that it is unattended.
95. Subject to paragraph 96, where it is not reasonably practicable to shut down any mobile equipment while it is unattended, the operator of the mobile equipment shall secure it against accidental movement by placing the transmission in neutral, and setting a parking or mechanical brake, blocking the wheels, or by using other measures approved by the person in charge.
96. Where, in any circumstances described in paragraph 95, any mobile equipment is left unattended on an incline, it shall be secured against accidental movement by setting the parking or mechanical brake and blocking the wheels.
97. No operator who is operating a crane, hoist or similar materials-handling equipment shall leave any such equipment unattended other than in a condition of maximum stability, unless some other equally safe measure approved by the person in charge is taken to prevent the equipment from tilting.

#### Positioning and Securing Load

98. Where mobile equipment is travelling with a raised or suspended load, the operator shall ensure that the load is carried as close to the ground or floor level as good industrial safety practice and local conditions

permit, and in no case shall the load be carried at a point above the centre of gravity at which the loaded mobile equipment would become unstable.

99. No operator shall operate or be permitted to operate mobile equipment that is loaded in such a manner as to obstruct the view in the direction of travel.
100. No operator shall operate or be permitted to operate any materials-handling equipment unless the load that it is carrying is so secured that it cannot slide or move to a dangerous extent, or be toppled or dislodged from the equipment under any normal condition of operation, including a sudden swerve or an emergency stop at the maximum speed authorized in each circumstance.

#### Housekeeping

101. The floor, cab and other occupied parts of any materials-handling equipment that is operated or used by any employee are to be kept free of any grease, oil, materials, tools or equipment that might cause a fire hazard or an employee to slip or trip, or might otherwise interfere with safe operation of the equipment.

#### Parking

102. No operator shall park any mobile equipment in a corridor, aisle, doorway or other place where that equipment might interfere with safe movement of other equipment, materials or persons.

#### Danger Area

103. In this section, "danger area" means any area within which a crane, hoist, shovel or other readily mobile materials-handling equipment or equipment with wide-swinging booms or other similar parts is operating and might injure any person.
104. The main approaches to any danger area are to be posted with suitable warning signs or shall be under the control of a signalman while operations are in progress.
105. No employee or other person shall enter or be permitted to enter a danger area while operations are in progress, unless that person is a safety officer, or an employee whose presence in the danger area is essential to the conduct, supervision or safety of the operations, or a person who has been authorized by the person in charge to be in the danger area.
106. If any person, other than a person referred to in paragraph 105, enters a danger area while operations are in progress, the person in charge shall ensure that operations in that area are immediately discontinued and are not resumed until that person has left the area.



107. Subject to paragraph 104, any materials-handling equipment or part thereof that is operated or used shall not, because of the wide swing of its booms or overhead loads, or for any other reason, extend into any adjacent travelled or other occupied areas outside the danger area.
108. Where it is not otherwise reasonably practicable for an operator to avoid the extension of any materials-handling equipment or any part thereof into areas outside the danger area, the person in charge shall ensure that barricades, overhead protection or other barriers are erected to prevent any such extension; or a signaller is provided to warn the operator when there is danger of any such extension outside the danger area.

#### Overhead Loading

109. No operator shall occupy the operator's position on any mobile equipment if, during the overhead loading or unloading by other equipment, the load must pass over the operator's position, unless that position is protected by an overhead shield or guard of sufficient strength to prevent injury to the operator in the event that the load accidentally falls on the mobile equipment.

#### Overhead and Underground Hazards

110. No operator shall begin or be permitted to begin the operation of any materials-handling equipment in an area where there is a danger that it might contact an electrical cable, gas pipeline or other overhead or underground hazard unless the operator has been
- (1) warned of the presence of every such known hazard;
  - (2) instructed, in accordance with the best information available, concerning the exact location of every overhead or underground electrical cable, gas pipeline or other hazard in the immediate vicinity of the operation; and
  - (3) informed of the specified safety clearances that must be maintained with respect to any overhead or underground hazard in order to avoid contact with it.
111. Where the location of a hazard referred to in paragraph 110 cannot be determined with certainty, or the person in charge is unable to provide the safety clearances referred to in paragraph 110 (3), every electrical cable is to be de-energized and every pipeline containing a dangerous substance is to be shut down and drained before a digging or other operation involving the use of materials-handling equipment commences within the area of possible contact with such a hazard.



### Bumping Blocks

112. Where rear dumping mobile equipment is required to discharge its load at the edge of a sudden drop in grade level that is of sufficient depth to cause tipping to the mobile equipment, a suitable bumping block shall be installed, or a signalman or other means of signalling, as approved by the person in charge, is to be provided.

### Fuelling

113. Materials-handling equipment using flammable fuels shall be fuelled in accordance with requirements or standards prescribed by the Dominion Fire Commissioner.

### Maximum Grades

114. No operator shall operate or be permitted to operate any mobile equipment on a gradient in excess of
- (1) the gradient that is recommended as safe by the manufacturer of the mobile equipment; or
  - (2) such lesser gradient that, in the opinion of the person in charge, is safe having regard to the mechanical condition of the mobile equipment, the weight of the load it is transporting and the condition of the roadway.

### Signals

115. A copy of the appropriate standard code of signals shall be provided to each signalman and to all employees who may be required to obey or give such signals, and such employees are to be instructed, trained and tested in the use of the code.
116. A copy of the standard code of signals shall be filed and be readily available for examination by a safety officer.
117. Signals used to direct the safe movement or operation of any materials-handling equipment are to be given only by a signalman.
118. No employee, other than a signalman, shall give signals to direct the movement or operation of any materials-handling equipment; however, any person may cause a stop signal to be given in an emergency and any such signal shall be obeyed by an operator.
119. No signalman shall direct the movement or operation of any materials-handling equipment, except in accordance with a standard code of signals.
120. No signalman shall be employed or occupied otherwise than as a signalman during the time that any mobile equipment under his or her direction is in motion or operation in an area where signals are required to be given.

121. Where, in any work area, signals are required for the safe direction of any mobile equipment, and it is not reasonably practicable to use visual signals, the person in charge shall ensure that a telephone, radio or other appropriate signalling device is installed and used.
122. No person shall use radio transmitting equipment for the purpose of transmitting signals in any area when such use might activate electric blasting equipment.
123. Before using a radio for the purpose of transmitting signals, the person in charge shall ensure, to the extent that is reasonably practicable, that another transmitting device within the vicinity will not interfere with reliable transmission of signals.
124. Every wire and cable used in a signalling system referred to in this section is to be protected against damage that is likely to interfere with the transmission of signals.
125. Any signalling device referred to in paragraph 121 that functions unreliably or improperly shall be immediately removed from service, and not returned to service until it has been examined, repaired and tested by a qualified person, and found to be functioning properly.
126. Where a signalling device referred to in paragraph 121 functions unreliably or improperly and the operation of any mobile equipment cannot be safely directed by another means of signalling, the mobile equipment is to be shut down until the signalling device is functioning properly.
127. Every employee operating a defective signalling device shall, as soon as is reasonably practicable, report the defect to the person in charge.
128. Where the safety of any person is likely to be endangered by the unexpected movement of any materials-handling equipment that is controlled by a signal, the signalman shall not give the signal to move until that person is properly warned or protected.
129. Where the operator of any materials-handling equipment does not clearly understand a signal, he or she shall regard that signal as a stop signal.

#### Ropes, Slings and Chains

130. Any rope or sling, or any attachment or fitting thereon that is used by any employee, should be used and maintained in accordance with the recommendations contained in the 7th Edition of the Accident Prevention Manual of the National Safety Council, as amended from time to time, or with a standard that conforms to good industrial safety practice.
131. Information and/or advice concerning good industrial safety practice or other safety procedures or codes concerning the use and maintenance of ropes, slings and chains may be obtained from the appropriate Labour Canada Regional Director.

132. No employee shall use or maintain any rope, sling or chain, except in accordance with the requirements prescribed under this section.

#### Manual Handling of Materials

133. Where, in the opinion of the person in charge, the manual handling of any material or object may endanger the safety or health of an employee, the person in charge shall ensure that the material or object is not so handled.
134. Employees who are regularly required to manually handle materials will be instructed in a safe method of handling such materials, and in any other work procedures related to that work and appropriate to the employee's physical capabilities.
135. Employees shall manually handle materials in conformity with a method and work procedure referred to in paragraph 134.
136. Each method and work procedure adopted pursuant to paragraph 134 for the manual lifting and carrying of loads in excess of one hundred pounds (45 kg) shall be set out in writing and that record shall be readily available for review by a safety officer or any employee to whom it applies.

#### Storage of Materials

137. Subject to this Standard, and all other applicable Public Service Safety Standards, all materials are to be stored in accordance with the recommendations contained in the 7th Edition of the Accident Prevention Manual of the National Safety Council, as amended from time to time, or with any standard that conforms to good industrial safety practice. They shall also be stored in accordance with the fire safety requirements of the Dominion Fire Commissioner.
138. All materials are to be placed and stored in such a manner that the maximum safe load-carrying capacity of the floor and any other supporting structure is not exceeded.
139. Materials that are stacked in piles shall be stacked in such a manner that the piles do not
- (1) create a hazard by interfering with the distribution of light;
  - (2) obstruct or encroach upon passageways, traffic lanes or exits;
  - (3) impede the safe operation of materials-handling equipment;
  - (4) obstruct the ready access to, and the use and operation of, fire-fighting equipment;

- (5) interfere with the proper operation of sprinklers and other fixed fire protection and prevention equipment and devices;
  - (6) endanger the safety and health of any employee; and
  - (7) conceal any warning signs or symbols.
140. All materials are to be stored in such a manner that they will not collapse, fall, slip, topple or otherwise endanger employees who are stacking or removing materials or working in the storage area.

#### General

141. Where a person in charge, or other responsible departmental official, is informed in writing by a Labour Canada Regional Director that any materials-handling equipment, floor, dock or any other structure may not be safe for any reason, the person in charge, or official, shall ensure that the maximum safe load or other operating restrictions in respect to the equipment, floor, dock or other structure is determined by a qualified person and one copy of the report of such determination shall be submitted to the Labour Canada Regional Director.
142. Any safety restriction or revised safe load limits shall continue in force until the original safety of the equipment or other facilities is restored.

Application

1. This Standard applies to all Public Service departments and agencies, as defined in Part I of Schedule I of the Public Service Staff Relations Act.

Purpose

2. This Standard outlines the requirements for the safe operation of motor vehicles owned or leased by Public Service department and agencies, to ensure the safety of employees and the public, and to avoid property or equipment damage.

Definitions

3. In this Standard
  - (1) "motor vehicle" means a truck, tractor, trailer, semi-trailer, automobile, bus or other similar self-propelled vehicle used primarily for transporting personnel and/or material;
  - (2) "motor vehicle operator" is any employee who is required to operate a motor vehicle in the performance of his or her duties;
  - (3) "motor vehicle accident" is an event involving the operation of a motor vehicle which results in injury to persons and/or damage to equipment or property.

General Responsibilities

4. Departments and agencies shall be responsible for
  - (1) developing appropriate departmental rules and procedures for the safe operation of motor vehicles, in accordance with the general principles set forth in this Standard;
  - (2) analyzing and evaluating motor vehicle accident reports and statistics, determining the causes of accidents and utilizing this information to prevent additional accidents from similar causes;
  - (3) ensuring that every motor vehicle is maintained in a safe operating condition;
  - (4) ensuring that every motor vehicle operator is qualified in all respects to operate the vehicle to which he or she is assigned;
  - (5) enforcing safe driving rules and traffic regulations on premises and in operations under their control;

- (6) co-operating with civil authorities in the enforcement of traffic laws and the observance of safe practices; and
- (7) ensuring that employees are fully informed of the correct procedures to be followed in the event of an accident.

#### Safe Operation of Motor Vehicles

5. The operation of motor vehicles in an unsafe condition is prohibited. A motor vehicle is unsafe when any defect exists which, in the judgement of the responsible supervisor in consultation with an authorized motor vehicle mechanic, could contribute to an accident. A motor vehicle operator shall not be required to operate a mechanically unsafe vehicle or a vehicle loaded in a hazardous manner.
6. All motor vehicles, including emergency motor vehicles such as ambulances, shall be operated in a prudent manner and at speeds compatible with road, traffic, weather and visibility conditions, and in compliance with the appropriate federal, provincial, territorial or municipal laws.

#### Hazardous Movement

7. Prior to the movement of oversize or overweight motor vehicles, or those carrying dangerous articles or equipment over public highways, notification of the route and the utilization of public bridges, tunnels and/or highways is to be given to appropriate civil officials.

#### Medical Examination of Motor Vehicle Operators

8. Persons whose primary function is the operation of a motor vehicle are required to undergo periodic health examinations in accordance with the Periodic Health Evaluations Standard, TB STD 3-13.

#### Qualification of Motor Vehicle Operators

9. Every motor vehicle operator shall possess a valid licence to operate the motor vehicle to which he or she is assigned in accordance with the appropriate provincial or territorial law, or as may be otherwise required by regulations or statutes applicable to the Public Service.
10. In addition, motor vehicle operators may be required to demonstrate their competence to operate assigned motor vehicles and, in this regard, appropriate records should be maintained.

#### Training

11. Departments and agencies shall, where appropriate, institute or participate in motor vehicle operator training programs designed to provide

- (1) refresher training to acquaint personnel with changes in equipment or operating conditions; and
- (2) remedial training to offset specific weaknesses indicated by accident records, traffic rule violations or other instances of inadequate operating performance.

### Investigation of Accidents

12. Every motor vehicle accident is to be investigated, the cause or causes determined and appropriate corrective action applied. Additionally, a supervisor's accident investigation report is to be completed in accordance with Procedures for the Investigation, Reporting and Recording of Accidents and Injuries, TB PROC 4-1.

### Accident Rate

13. Departments and agencies should compute an accident rate in accordance with paragraph 14 at least annually, and maintain a record of the cost of vehicle repairs or replacement as a result of accidents.
14. The accident rate is to be determined by multiplying the number of motor vehicles involved in accidents by a constant of 100,000 miles (kilometres) and dividing by the number of miles (kilometres) operated for the period. The formula is shown in the example below:

Number of vehicles involved in accidents (23) x 100,000 <hr style="width: 100%;"/> Miles (kilometres) operated (2,416,407)	=	Vehicle Accident Rate (0.95)
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Note: If the same motor vehicle is involved in more than one accident during the period for which the accident rate is being computed, it shall add to the total "Number of vehicles involved in accidents" on each occasion. Hence, if one motor vehicle is involved in three accidents during the period, it is to be represented as three motor vehicles in the foregoing formula.

### Motor Vehicle Servicing and Inspection

15. Each department and agency is responsible for ensuring that the servicing and inspection of its motor vehicles meet normal preventive maintenance and safety requirements commensurate with the use of motor vehicles, but in no case should the level of maintenance be less than the requirements outlined in the appropriate manufacturer's user manual.
16. At the start of each shift, each operator is to be responsible for carrying out a brief inspection of the motor vehicle assigned. Defects are to be reported promptly to the responsible supervisor.

### Safe Transportation of Personnel

17. To the maximum extent possible, personnel are to be transported in passenger-type motor vehicles such as sedans, station wagons and buses. The following safety rules governing passengers shall apply:
  - (1) only authorized personnel shall be permitted to ride in motor vehicles;
  - (2) the number of persons permitted to ride in a passenger motor vehicle must not exceed the seating capacity of that motor vehicle except when being transported locally for short distances in buses provided with handholds;
  - (3) personnel shall not be permitted to ride with any part of their person extended outside the motor vehicle, or on the running board, fender, cab, side or the tailgate of the motor vehicle, nor to board or alight from a motor vehicle while it is in motion.
18. When it is not possible or practicable to use passenger motor vehicles to transport personnel, truck-type motor vehicles may be used. In such cases the additional safety measures listed below shall apply:
  - (1) fixed seating is to be provided and sideboards or stakes and tailgates fitted;
  - (2) the number of personnel to be transported may not exceed that for which fixed seating is provided;
  - (3) a suitable cover should be provided for protection from the elements;
  - (4) tools, equipment and cargo should be properly stowed and secured to prevent shifting in transit;
  - (5) the motor vehicle operator shall:
    - (a) brief personnel on safety requirements and appoint a person in charge of passenger conduct;
    - (b) release and lower the tailgate prior to the loading and unloading of passengers; and
    - (c) operate the motor vehicle with special caution relating to speed, road conditions, starting, stopping and turning.
19. Under special conditions, trucks without fixed seating may be used for transporting small groups (less than ten) for short distances on the department's premises. Passengers are to be in a secure position within the body of the truck, and the vehicle driven with extreme caution. If the use of a dump truck is authorized for such a purpose, the hoist controls are to be positively secured to prevent inadvertent operation.



## Fire Prevention

20. No motor vehicle shall be operated unless it is entirely free of fuel leaks.
21. Motor vehicles are to be equipped with portable fire extinguishers where required, according to Fire Protection Engineering Standards published by the Dominion Fire Commissioner.

## Motor Vehicle Fuelling

22. The following safety procedures and/or any other applicable procedures specified by the Dominion Fire Commissioner shall be followed during the fuelling of motor vehicles:
  - (1) motor vehicles are not to be fuelled indoors;
  - (2) only qualified personnel should be permitted to fuel motor vehicles;
  - (3) open flame, spark-producing devices or smoking is not be allowed within 50 feet (15 m) of fuelling operations or areas;
  - (4) during fuelling, the engine of the motor vehicle must be stopped, the ignition and lights turned off, the parking or emergency brake applied, and the nozzle of the fuel hose kept in contact with the fuel intake pipe to prevent electrical arcing;
  - (5) when reserve supplies of fuel are to be carried on motor vehicles, they shall be carried in approved containers adequately secured and protected.
23. Tank trucks shall be loaded and unloaded in authorized areas by qualified personnel and under controlled procedures, in accordance with the Fire Protection Engineering Standards published by the Dominion Fire Commissioner.

## Safety Measures Against Asphyxiation

24. The concentration of toxic exhaust fumes to which the operator and other persons are exposed when working on or near motor vehicles shall not exceed maximum levels as may be prescribed for the Public Service in applicable safety standards.

## Motor Vehicle Safety Belts

25. Operators of, and passengers in, motor vehicles which are equipped with safety belts shall be required to fasten such safety belts in the approved manner at all times when the vehicle is in motion.

#### Highway Warning Devices

26. Motor vehicles operated on roads or in areas at speeds of more than 20 miles (30 km) per hour below the posted speed for the road or area shall be equipped with a warning device, as prescribed by the statutes of the province or territory in which the vehicle is operated, or in the absence of such requirements, in accordance with Canadian Standards Association standard Slow Moving Vehicle Warning Device, D198-1967, and amendments thereto.
27. In the event that a motor vehicle becomes disabled on or adjacent to the highway, advance warning devices such as flares or reflectors shall be placed in accordance with the statutes of the province or territory in which the vehicle is disabled.

#### First Aid Kits

28. Motor vehicles are to be equipped with first aid kits in accordance with the requirements of the First Aid Standard, TB STD 3-5.

### Application

1. This Standard applies to all Public Service departments and agencies, as defined in Part I of Schedule I of the Public Service Staff Relations Act.

### Monitoring and Exposure

2. Safety officers designated by the Minister of Labour pursuant to Part IV of the Canada Labour Code, and environmental health officers of Health and Welfare Canada, will monitor noise levels and exposure to noise and, where necessary, give appropriate direction to departments and agencies, in accordance with the requirements of this Standard.

### Measurement of Sound Levels

3. Sound level measurements shall be made with a sound level meter that complies with the American National Standards Institute standard S1.4-1971 for Type 2 "General Purpose" or Type S2A "Special Purpose" sound level meters, as amended from time to time.
4. Sound levels shall be determined by using the slow meter response and the "A" weighting scale of the sound level meter, or calculated by applying the "A" scale weighting factor to each octave band level of the sound, and combining those levels.

### Maximum Noise Exposure

5. Subject to paragraphs 6 and 7, no employee shall be permitted to work where the sound level is more than ninety decibels.
6. Where it is not reasonably practicable to reduce the sound level at a work site to 90 decibels or less, employees may be permitted to work where they are exposed each day to
  - (1) a sound level set out in Column I of Table I for a number of hours or portions thereof not exceeding that specified in Column II of the Table for that sound level; or
  - (2) a number of different sound levels, each of which is set out in Column I of the Table, if the sum of the following ratios does not exceed unity (i.e. the ratios of the actual exposure time each day at each of those sound levels, to the maximum permitted exposure per day specified in Column II of the Table for each of those sound levels respectively).
7. Where it is not reasonably practicable to comply with paragraphs 5 or 6, employees may be permitted to work where they are exposed to sound levels

of more than ninety decibels if each employee is provided with and wears a hearing protector. The hearing protector must comply with the Canadian Standards Association standard Z94.2-1974, as amended from time to time, or with any other standard acceptable to Health and Welfare Canada, and it must reduce the sound reaching the ears of the wearer to a level below ninety decibels.

8. The requirements of paragraph 7 may be waived in respect to an employee working in a place where the noise level exceeds 90 but does not exceed 95 decibels, where a test of the employee's hearing level establishes that he can work without any permanent impairment of hearing, and provided the employee's hearing level is tested regularly.
9. Such tests shall be conducted in accordance with the requirements outlined in the Periodic Health Evaluations Standard, TB STD 3-13.
10. An employee shall not be permitted, at any time, to be exposed to impulse or impact sound which exceeds a peak sound pressure level of 140 decibels, unless appropriate approved hearing protection is being worn.

#### Noise Survey

11. Where, in the opinion of a safety officer or an environmental health officer, employees in any workplace are exposed to sound at levels that may impair their hearing, such officers should conduct a survey of the sound levels in that place, or require that a survey be conducted in accordance with the Procedures for Occupational Health Investigations and Surveys, TB PROC 4-2. Such officers may also require that employees, who have been subjected to sound levels that may impair hearing, be tested in accordance with paragraph 9.

#### Records

12. Departments should ensure that a record of every test or survey relating to noise control or hearing impairment is retained for at least five years, and is available for examination by a safety officer or an environmental health officer, or other authorized person.

#### Changes in Conditions

13. Departments are encouraged to notify the appropriate Labour Canada Regional Director of changes in any equipment, layout or work procedure that might significantly increase the exposure of any employee to sound levels exceeding those specified in this Standard.

#### Warning Signs

14. Departments shall post and maintain signs at the entrance to all work sites where the sound levels exceed ninety decibels, or where impact sound exceeds a peak sound pressure level of one hundred and forty decibels, warning persons entering those sites of the dangerous sound levels, the permissible length of exposure and, where hearing protectors are prescribed, of the requirement to wear such protectors.

TABLE I  
MAXIMUM PERMITTED NOISE EXPOSURE AT A WORK SITE

<u>Column I</u>	<u>Column II</u>
<u>Sound Level in Decibels</u>	<u>Maximum Number of Hours of Exposure per Workday</u>
more than 87 but not more than 90	8
more than 90 but not more than 92	6
more than 92 but not more than 95	4
more than 95 but not more than 97	3
more than 97 but not more than 100	2
more than 100 but not more than 102	1.5
more than 102 but not more than 105	1
more than 105 but not more than 110	0.5
more than 110 but not more than 115	0.25
more than 115	0



Application

1. This Standard applies to all Public Service departments and agencies, as defined in Part I of Schedule 1 of the Public Service Staff Relations Act.

Definition

2. In this Standard, the term "health evaluation" means any specific screening, assessment or examination of an employee which is carried out by a health professional to determine or monitor the employee's occupational health status, and includes simple interventions such as immunizations.

Purpose

3. The principal objectives of health evaluations are: to act as a means of preventing illness and disability arising out of, or aggravated by, conditions of work; to establish that individuals are able to continue working without detriment to their health or safety or that of others; and to establish the conditions under which certain individuals with illnesses or disabilities are able to continue working.
4. Health evaluations are generally provided in respect of specific occupations which have an inherent element of risk to the health or safety of an employee; where an employee's actions could result in a threat to the health and safety of another; before certain postings; and where a Public Service standard, policy directive or guideline provides that such evaluations may be requested at the discretion of departmental management or Health and Welfare Canada.

Specific Application and Exclusions

5. Health evaluations shall be required for employees engaged in the occupations/activities listed in Table 1, Health Evaluation Schedule. Occupations referred to in Orders in Council governing physical standards for Civil Aviation Personnel are excluded from this Standard.

Procedures

6. All health evaluations are to be arranged by the employing departments and agencies through the appropriate zone or regional office of Medical Services Branch, Health and Welfare Canada, using the forms and procedures prescribed by that department.

7. Health evaluations will be initiated in accordance with the frequencies specified herein. However, in individual cases, Health and Welfare Canada may recommend investigations or evaluations at intervals more frequent than those prescribed in Table 1. Health evaluations shall be carried out wherever practicable during normal working hours.
8. The medical costs associated with health evaluations, except those subject to Foreign Service Directives, are the responsibility of Health and Welfare Canada. Where an employee is required to undertake travel for a health evaluation, the employee will be considered in travel status, and reimbursement of expenses incurred shall be governed by the Treasury Board Travel Directive or other applicable authority.
9. Following any health evaluation, a non-medical interpretation or report indicating the employee's capability to perform the required work will be forwarded by the appropriate Medical Services Branch office of Health and Welfare Canada to the employing department. This report will not contain any medical or psychological diagnosis or provide any reasons for the conclusions drawn in the report.
10. Where work limitations are identified, the statement will incorporate advice to management concerning the adaptation or selection of work, or the placement or reassignment of the employee, and the estimated duration of such limitations. In this regard, departments shall make every effort to provide work for which the employee is physically qualified and is, or can be, trained to perform.
11. Each employee will be advised of the results of a health evaluation by Health and Welfare Canada. In the event of a health problem being discovered, the employee should be referred to his or her own physician for advice.

#### Special Evaluations

12. Subject to the requirements of paragraphs 6 and 9, departments should arrange for special health evaluations where:
  - (1) on the advice of Health and Welfare Canada, an employee has been exposed to an occupational health hazard;
  - (2) a health problem may be the cause of impaired work performance which has been identified through an Employee Assistance Program;
  - (3) in the judgement of the person in charge, the work performance of an employee during the employee's probationary period appears to be consistently impaired owing to factors which may be related to health or physical condition. In this case, the health evaluation should be directed towards confirming the employee's physical suitability for continued employment in that position.



### Health Evaluation Categories

13. The three health evaluation categories are as follows:

- Category 1: A confidential general health questionnaire completed by the employee and screened by a nurse. Unusual clinical histories will be brought to the attention of a physician, who will determine whether follow-up action is necessary. (This category is not applicable at this time).
- Category 2: A confidential general health questionnaire administered by a nurse, who may also perform certain basic investigations depending on the type of work and particular hazards involved. A qualified technician may carry out some of these procedures, including the completion of special reports, but does not administer the general health questionnaire.
- Category 3: A confidential health questionnaire, administered by a nurse or physician, followed by a full clinical history and physical examination, and special investigations as required.

### Physical Examination Standards

14. The establishment of all physical examination standards is the responsibility of Health and Welfare Canada, in consultation with appropriate specialists.

### Medical Confidentiality

15. All medical information, forms and records transmitted or used in connection with these health evaluations will be maintained in a medical confidential status, and retained within the medical community as authorized by Health and Welfare Canada.

TABLE 1  
HEALTH EVALUATION SCHEDULE

<u>GROUP</u>	<u>OCCUPATION/ACTIVITY</u>	<u>CATEGORY</u>	<u>FREQUENCY</u>
1	Not allocated.		
2	a. Hospital employees routinely in contact with patients.	2	Annually.
	b. Employees at Health and Welfare Canada nursing stations and Health Centres.		
3	a. Ship's personnel, including all other persons required to accompany a ship on a cruise.	3	Every 3 years to age 40 and annually thereafter; and
		2	Before each voyage where the ship will be more than 24 hours' cruising from a hospital
	b. Marine surveyors.	3	Every 3 years to age 40, and annually thereafter.
4	a. Personnel operating buses, ambulances, emergency vehicles, and heavy mechanical or mobile equipment. See Note 1.	3	Every 3 years to age 45, and annually thereafter.
	b. School bus operators.	2	Annually.
5	Not allocated.		
6	a. Personnel serving on detached field operations in remote areas.	3	Annually, before proceeding to remote areas.
	b. Ice observers.		
7	Radio operators (air) and air traffic control assistants.	3	Every 5 years.
8	Animal keepers, veterinarians, primary products inspectors (health of animals).	As Required	As determined by Health and Welfare Canada.
9.	Firefighters.	3	Every 3 years to age 35; every 2 years from age 36 to age 45; annually after age 45.

<u>GROUP</u>	<u>OCCUPATION/ACTIVITY</u>	<u>CATEGORY</u>	<u>FREQUENCY</u>
10	Not allocated.		
11	Personnel exposed to ionizing or non-ionizing radiation See Note 2.	As required	As required by Radiation Protection Bureau.
12	Personnel exposed to excessive noise levels, as defined in the Noise Control and Hearing Conservation Standard, TB STD 3-12.	2	Annually, or more frequently, as determined by Health and Welfare Canada.
13	Personnel exposed to chemical or biological hazards. See Note 3.	As required	As determined by Health and Welfare Canada.
14	Lightkeepers and dependants at remote locations.	3	Annually.
15	Personnel engaged in underwater diving, whether or not this is their primary duty.	3	Annually.
16	Personnel (including dependants) posted to isolated posts, as defined in the Isolated Posts Directives.	3	Before each posting.
17	Personnel (including dependants) serving abroad, subject to Foreign Service Directives.	3	Before each posting and cross-posting, and upon return to Canada.
18	Not allocated.		
19	Personnel liable to consistent arduous physical effort or exposure outdoors, as determined by Health and Welfare Canada and in consultation with the Treasury Board Secretariat. See Note 4.	3	Every 3 years to age 35; every 2 years from age 36 to 45; annually after age 45.
20	Marine traffic regulators.	2	Annually for audiogram; every 3 years for visual acuity.

- Note 1: Heavy mechanical or mobile equipment includes trucks (over 11,250 kg gross vehicle weight), hoists, cranes, excavators, graders, loaders, heavy tractors, trenchers, snow blowers and sweepers.
- Note 2: Personnel in this Group include those who are required to wear film badges for the detection of ionizing radiation, and personnel exposed to microwave radiation above the permitted energy level.
- Note 3: Chemical hazards include liquids, gases, dusts, fumes, mists and vapours. Biological hazards include insects, mites, nematodes, molds, yeasts, fungi, viruses and bacteria.
- Note 4: This Group may include certain employees of Parks Canada, avalanche forecasters and observers, and individuals in similar circumstances.

Application

1. This Standard applies to all Public Service departments and agencies, as defined in Part I of Schedule I of the Public Service Staff Relations Act.

Definitions

2. In this Standard
  - (1) "integrity" means, in respect of any device or equipment, the ability of that device or equipment to retain all of the qualities essential to its safe, reliable and adequate performance;
  - (2) "person in charge" means a qualified person appointed to ensure the safe and proper conduct of an operation or of the work of employees;
  - (3) "personal protective equipment" means any special safety clothing, equipment or device worn or used by a person to protect that person from dangers of employment;
  - (4) "qualified person" means a person who, because of knowledge, training and experience, is qualified to perform safely and properly a specified job;
  - (5) "safety officer" means a person who is designated as a safety officer by the Minister of Labour pursuant to the Canada Labour Code, Part IV, Section 87;
  - (6) "safety restraining device" means any safety belt, safety harness, seat, rope, belt, strap or lifeline designed to be used by an employee to protect that employee from the danger of falling, and includes every fitting, fastening or accessory thereto.

General Responsibility of Departments

3. Where it is not reasonably practicable to eliminate or to control an employment danger within safe limits, and the wearing or use of personal protective equipment by an employee will prevent an injury or significantly lessen the severity of an injury, departments shall ensure that each employee who is exposed to such danger wears or uses that equipment as prescribed by this Standard.
4. The provision of personal protective equipment shall be in accordance with the Policy and Guidelines on the Provision of Clothing to Federal Government Employees.

5. Employees are to be instructed and trained in the proper and safe operation, use and care of all personal protective equipment that they are required by this Standard to wear or use.
6. All personal protective equipment worn or used by employees shall be adequate in all respects to protect the employee from the hazards of employment, be otherwise suitable for use by the employee, and have been so designed that it does not in itself create an employment hazard.
7. All personal protective equipment shall be stored, maintained, inspected and tested by a qualified person for the purpose of ensuring that it is in a safe and fully effective condition at all times.
8. A record of personal protective equipment shall be maintained in accordance with good industrial safety practice, or as recommended by a Labour Canada Regional Director, and shall be readily available for examination. The record should contain the following information:
  - (1) a description of the equipment and date of its purchase or acquisition;
  - (2) the date and result of each inspection and test of the equipment; and
  - (3) the date and nature of any maintenance work performed on the equipment since its purchase or acquisition.

#### General Responsibility of Employees

9. No employee shall commence a work assignment or enter a work area where any kind of personal protective equipment is required to be worn or used unless the employee
  - (1) is wearing or using that kind of personal protective equipment in the manner prescribed in this Standard;
  - (2) has been instructed and trained in the proper and safe operation and use of that personal protective equipment; and
  - (3) has visually inspected that personal protective equipment to ensure that, as far as is reasonably practicable, it will provide protection against the hazards of employment.
10. Every employee shall care for all personal protective equipment that is assigned, in accordance with the instructions and training given as outlined in paragraph 5.
11. Every employee shall immediately report to the person in charge any personal protective equipment that, in the opinion of the employee, no longer adequately provides protection from the hazards of employment.

### Head Protection

12. Where, in accordance with paragraph 3, an employee is required to wear a safety hat, the safety hat shall comply with the recommendations of Canadian Standards Association standard Z94.1-M1977 "Industrial Protective Headwear", or with a standard recommended by Labour Canada.
13. Where, in accordance with paragraph 3, an employee is required to wear a form of head protection other than a safety hat, such head protection shall comply with good industrial safety practice, or with a standard recommended by Labour Canada.

### Eye and Face Protection

14. Where, in accordance with paragraph 3, an employee is required to wear eye or face protection, such eye or face protection shall comply with Canadian Standards Association standard Z94.3-1969 "Eye Protectors", or with a standard recommended by Labour Canada.

### Foot and Leg Protection

15. Where, in accordance with paragraph 3, an employee is required to wear safety shoes or boots, such footwear shall have soles and heels of a material that will minimize slipping under all conditions of their normal use, and in all other respects they shall comply with Canadian Standards Association standard Z195-1970 "Safety Footwear", or with a standard recommended by Labour Canada.
16. Where, in accordance with paragraph 3, an employee is required to wear leg protection or foot protection other than safety shoes or boots, such leg protection or foot protection shall comply with the appropriate Canadian Standards Association standard, or with a standard recommended by Labour Canada.
17. No employee shall, in an industrial fabricating, processing, maintenance, repair or storage area or in any workplace designated by a department
  - (1) fail to wear footwear; or
  - (2) wear any footwear with open toes, or footwear made of any material or of a construction or design that, in the opinion of a responsible departmental authority or a safety officer, does not adequately protect the employee from the risk of injury associated with employment.

### Skin Protection

18. Where, in accordance with paragraph 3, an employee is required to wear personal protective equipment or a barrier cream for skin protection,
  - (1) such personal protective equipment or barrier cream shall be adequate to protect the skin of the employee during the entire period during which the skin is exposed to any danger; and

- (2) if such personal protective equipment or barrier cream is not disposable, it shall be maintained in a clean and sanitary condition.

### Respiratory Protection

19. Where, in accordance with paragraph 3, an employee is required to wear respiratory equipment, such respiratory equipment shall be of a type approved for its intended use by the United States Bureau of Mines, or by a person or agency recommended by Health and Welfare Canada or Labour Canada.
20. Where air or oxygen is provided in connection with any respiratory equipment referred to in paragraph 19, the air or oxygen shall comply with Canadian Standards Association standard Z.180.1-M1978, "Compressed Breathing Air", or with a standard recommended by Health and Welfare Canada or Labour Canada.

### Safety Restraining Devices

21. Unless an employee is wearing a safety restraining device that complies with this Standard, the employee shall not be required or permitted to work while standing on or supported by
- (1) any unenclosed or unguarded work structure that is
    - (a) more than 2.4 m directly above the nearest permanent safe level;
    - (b) above an operating machine that could cause injury to the employee upon contact; or
    - (c) above any open-top tank, pit or vat;
  - (2) any scaffold or other similar elevated work structure that is more than 6 m above a permanent safe level and from which the employee may fall if the structure tips or fails;
  - (3) any ladder at a height more than 2.4 m directly above the nearest permanent safe level if, because of the nature of the work, one hand cannot be used to hold onto the ladder; or
  - (4) any other elevated work structure in respect of which a Labour Canada Regional Director recommends that a safety restraining device be used.
22. Notwithstanding paragraph 21, the use of a safety restraining device is not required where



- (1) the use of a safety restraining device is, in the circumstances, unsafe or not reasonably practicable; and
  - (2) other safety measures recommended by a Labour Canada Regional Director are employed.
23. Every ladder from which an employee is working, as described in paragraph 21 (3), shall be secured in such a manner that it cannot be accidentally or inadvertently dislodged from its position.
24. To the extent that it is reasonably practicable, every safety restraining device used by employees is to be of sufficient strength, at all times and under all conditions of its use, to support, without failure or loss of integrity, the maximum load to which it will be subjected and
  - (1) a static load of not less than 450 kg; and
  - (2) a load of not less than 180 kg that is applied suddenly at the end of a 1.2 m vertical drop or such greater distance as the safety restraining device may permit the load to fall.
25. Each type of safety restraining device required by this Standard to be worn or used by employees shall, prior to being worn or used, be tested in the manner prescribed in paragraph 27, for the purpose of determining whether the design and fabrication of that type of safety restraining device satisfies the test requirements stated therein.
26. The test referred to in paragraph 25 shall be conducted by the manufacturer, distributor or seller of the safety restraining device, or by a person or agency recommended by Labour Canada.
27. At least one representative sample of each type of safety restraining device produced by each manufacturer shall, after it is assembled, be subjected for test purposes to
  - (1) loads that are one and one-half times the loads prescribed in paragraph 24 (1) and 24 (2); or
  - (2) any other load or test recommended by Labour Canada.
28. If the sample restraining device referred to in paragraph 27 is unable to support without failure of any kind the test load referred to therein, departments shall ensure that none of the restraining devices of which it is representative is used by their employees.
29. The sample restraining device tested pursuant to paragraph 27 shall
  - (1) not be placed in service after being subjected to the test loads prescribed by that paragraph;

- (2) be marked or tagged to indicate that it is not to be placed in service;
  - (3) be marked or tagged with the date of the test and the name and position of the person who conducted the test; and
  - (4) be readily available for examination by a safety officer.
30. The test referred to in paragraph 27 shall, with respect to each manufacturer of safety restraining devices, be conducted before distribution. Where there is a change in the design, method of fabrication or the kind of quality of material used in the fabrication of the safety restraining device, the test shall be conducted as soon as is reasonably practicable after the change is made and, in any event, before the safety restraining device incorporating or resulting from that change is distributed.
  31. Where a written guarantee or warranty is given by the manufacturer, distributor or seller of a type of safety restraining device, representing that the type of safety restraining device in question has been tested and complies with the requirements of this Standard, that type of safety restraining device may be deemed to have been tested and to comply with the requirements of paragraphs 25 and 27.
  32. Any body safety belt is deemed to satisfy the requirements of paragraph 27 if it complies in all respects with the requirements of Canadian Standards Association standard Z259.3-M1978, "Lineman's Body Belt and Lineman's Safety Strap".
  33. Each fitting, anchor and accessory used in connection with a safety restraining device shall comply with the recommendations contained in the Canadian Standards Association standard Z91-M1980, "Safety Code for Window Cleaning Operations".
  34. To the extent that it is reasonably practicable, every safety restraining device shall be worn or used in such a manner that the person wearing or using it cannot fall freely for more than 1.2 m.
  35. Paragraph 34 does not apply to a safety restraining device that incorporates a shock-absorbing mechanism that limits the effect of the fall to that produced by a free fall of 1.2 m or less.
  36. Not more than one person shall use one lifeline at the same time.
  37. All safety restraining devices shall be inspected and serviced by a qualified person at intervals appropriate to their use, and safety restraining devices that are used once a week or more often shall be inspected and serviced by such a person at least once each month.
  38. Where a safety officer is of the opinion that an inspection made pursuant to paragraph 37 is not sufficient to determine the strength or integrity of a safety restraining device, or where its strength or integrity is

likely to be decreased because of its age or use, the safety officer may require that a representative sample of the safety restraining device be subjected to test loads as prescribed by paragraph 24 or such lesser loads as he or she considers appropriate.

39. Where a safety restraining device fails to meet the requirements of the test referred to in paragraph 38, two additional representative samples of the same type of safety restraining device shall be tested and, if either of such samples fails to meet those requirements, all safety restraining devices of which the samples are representative shall be removed from service.
40. Every safety restraining device that has been subjected to a load exceeding its maximum safe working load while being tested shall not be returned to service.
41. For the purpose of paragraph 40, the maximum safe working load is the quotient obtained when the minimum load in kilograms necessary to break the weakest part of the assembled safety restraining device is divided by five.

#### Drowning Hazards

42. No employee shall work or be permitted to work over water or at any other work location where there is a risk of drowning unless
  - (1) the employee is wearing an approved life jacket or other buoyancy device of a type described in paragraph 43; or
  - (2) the employee is prevented from falling into the water by a safety net or platform or a safety restraining device; and
  - (3) the employee is accompanied by at least one other person.
43. The life jacket or buoyancy device referred to in paragraph 42 (1) shall be a jacket or device capable of supporting a person with the head above water in a face-up position, without effort on the person's part, until rescue can be effected.
44. Where circumstances of work over or near water are such that, in the opinion of the person in charge or where recommended by a safety officer, a rescue boat is required, a suitable boat shall be provided and
  - (1) where reasonably practicable, be equipped with a suitable motor maintained in operational readiness;
  - (2) be operated by a qualified person and fitted with appropriate rescue equipment; and
  - (3) be held in readiness at a location enabling quick rescue during periods that such rescue services are required.

### Loose Clothing

45. Where an employee is wearing loose clothing, long hair, dangling accessories, rings or other jewellery that might become entangled with a machine or any rotating or moving part of that machine, or the metallic part of which might come into contact with energized electrical equipment, the employee shall not enter or be permitted to enter a work area where any such machine or equipment is operating unless the clothing, hair, accessories, rings or other jewellery is so tied, fitted, covered or otherwise secured as to prevent such entanglement or contact.

### Traffic Hazards

46. Any employee who is assigned to give traffic signals or direction or who is otherwise exposed to a possible hazard from vehicular traffic during work, shall
- (1) wear a high-visibility vest or other similar clothing; or
  - (2) be protected by a high-visibility barricade.
47. The high-visibility vest and barricade referred to in paragraph 46 shall be readily noticeable or distinguishable all of the time, and under all of the conditions that the employee is exposed to vehicular traffic.

Application

1. This Standard applies to all Public Service departments and agencies, as defined in Part I of Schedule I of the Public Service Staff Relations Act.

Introduction

2. The use of pesticides requires close control by departments and agencies to ensure that personnel are not exposed to health hazards from these toxic substances. The requirements of this Standard provide only a basic outline of the principal safe practices and procedures which are applicable. Therefore, departments and agencies should, in the development of more detailed local procedures, also use other appropriate reference publications pertaining to pesticides, including particularly the representative listing in Table 1.

Definition

3. In this Standard, "pesticides" means chemical and biological agents that act as acaricides, chemosterilants, insecticides, fumigants, fungicides, herbicides, rodenticides, nematocides, lampreycides, and other toxic substances used for the same general purposes.

Work Procedures

4. Each department or agency in which pesticides are used, handled, stored or disposed of shall ensure that
  - (1) detailed written procedures governing the safe use, handling, storage and disposal of such pesticides are developed, prominently displayed in the workplace, and explained to all employees concerned; and
  - (2) such procedures are applied and enforced in respect of all operations, including site preparation and decontamination, pesticide preparation and application, and disposal.

Use, Handling, Storage and Disposal

5. The following general requirements shall govern the use, handling, storage and disposal of pesticides:
  - (1) Substitution - Whenever possible, a less toxic pesticide shall be substituted for a toxic one, providing there is no significant impairment of its intended function.

- (2) Isolation - Personnel shall be isolated as much as possible from exposure to the pesticides being used.
- (3) Protective Equipment and Clothing - Approved respiratory protective devices, and personal protective clothing and equipment appropriate to the potential hazard, shall be provided and worn whenever pesticides are handled or used.
- (4) Storage - Pesticides shall be stored in appropriate containers and kept in appropriately ventilated locked cabinets or in areas with controlled access to avoid unauthorized use. Appropriate warning signs shall be prominently displayed to identify such locations.
- (5) Disposal - During disposal procedures, all possible precautions shall be taken to ensure that persons cannot be subsequently contaminated. Waste disposal shall be conducted in accordance with the "Code of Good Practice for Management of Hazardous and Toxic Wastes at Federal Establishments" (refer to Table 1), or with other codes or requirements authorized by Environment Canada for this purpose.
- (6) Mixing and Dispensing Equipment - Such equipment shall be of a standard acceptable to Health and Welfare Canada or Labour Canada, and be approved for use with the pesticide selected.

#### Decontamination Procedures

6. The procedures to be used for decontaminating equipment, containers and spill sites will vary with the toxic properties of the pesticide, the type of formulation and the quantity. In general, pesticide spills or inadvertent contamination of a site by pesticides should be confined as much as possible by the use of absorbents such as sawdust, sand or other commercially available absorbent materials. Absorbed pesticides should be put into suitable containers and disposed of in accordance with approved procedures. The site of the spill should, if possible, be cleaned by the use of detergent and water or other suitable and safe solvents, and may also require the addition of caustic compounds in order to accelerate chemical breakdown.
7. All pesticide containers which are empty and to be discarded should be rinsed repeatedly with a suitable solvent and rendered unusable by crushing or perforation. The rinsings and containers should then be disposed of in accordance with the approved procedures.
8. In most cases, equipment can be satisfactorily cleaned with detergent and water. The disposal of rinsings must follow approved procedures concerning the disposal of such waste.

### Inventories and Labelling

9. An up-to-date inventory of all pesticides in use and in storage shall be maintained at all times. Shelf-life of each container shall be clearly identified, and unused stocks shall be disposed of in an approved manner when the designated shelf-life has expired. All containers shall be properly labelled and identified to permit rapid and accurate identification of their contents. Containers of mixed pesticides, and pesticides in solution, shall be identified as to contents and concentration.

### Environmental Monitoring

10. Procedures involving the use of pesticides, either in the laboratory or in general field application, shall be monitored at regular intervals by the responsible authority within the department or agency, to ensure that prescribed safety procedures are being followed. If an independent survey or health investigation is considered advisable at any time, a written request should be submitted to the appropriate Medical Services Branch regional office of Health and Welfare Canada in accordance with TB PROC 4-2, Occupational Health Investigations and Surveys-Procedures.

### Housekeeping

11. Appropriate good housekeeping shall be followed in all areas where pesticides are mixed, stored or handled. This includes the maintenance of absolute cleanliness of the workplace and the use of approved waste disposal facilities and techniques, including adherence to the requirements of the Sanitation Standard, TB STD 3-18.

### Education and Training

12. Employees who handle pesticides shall be thoroughly trained in safety techniques respecting potential exposure to highly toxic compounds. This instruction must include the prescribed safe handling procedures, use of protective clothing and equipment, recognition of symptoms of exposure, and provision of first aid in the handling of possible casualties. Information and assistance in this regard shall be obtained from the appropriate Medical Services Branch regional office of Health and Welfare Canada.

### First Aid

13. First aid instructions, and emergency procedures to be followed for suspected casualties of pesticide poisoning, shall be displayed prominently in all areas where pesticides are stored, handled or used, and it shall be ensured that every employee involved in the use of pesticides is familiar with such instructions and procedures.

#### Personnel Monitoring

14. All personnel engaged regularly in work involving the handling of pesticides shall be examined, as required, in accordance with the provisions of the Occupational Health Evaluation Standard, TB STD 3-13. In this regard, a detailed history of exposure and the nature of exposure shall accompany the individual to be examined.

#### Sources of Information and Assistance

15. Information on registered pesticides may be obtained from the Pesticides Section, Plant Products and Quarantine Division, Agriculture Canada, the agency responsible for the regulation of such products.
16. Health and Welfare Canada will provide, on request, information on the effects of pesticide exposure, the treatment of exposed persons and advice concerning appropriate training, including emergency first aid.
17. Labour Canada, Occupational Safety and Health Branch, will provide, on request, technical and advisory services related to the development of safe operating procedures, and information concerning approved personal protective equipment.
18. The Environmental Protection Service of Environment Canada will provide, on request, advice concerning the disposal of pesticides.



TABLE I  
REFERENCE PUBLICATIONS

Pesticides and their Safe Use

The Canadian Agricultural Chemical  
Association,  
116 Albert Street, Room 710,  
Ottawa, Ontario.  
K1P 5G3

List of Poison Control Centres in Canada

Bureau of Epidemiology,  
Health Protection Branch,  
Health and Welfare Canada,  
Ottawa, Ontario.  
K1A 0L2

Pesticide Information and Safety Manual

The University of California,  
Agricultural Extension Service,  
Berkeley, California, 94720.

The Safe Use of Agricultural and Household Pesticides, Agricultural  
Handbook No. 321 - United States Department of Agriculture

Aerial Application of Agricultural Chemicals, Agricultural  
Handbook No. 287 - United States Department of Agriculture

Superintendent of Documents,  
United States Government Printing Office,  
Washington, D.C. 20402.

Canadian Armed Forces Manual on Pest Control - Fourth Edition

National Defence Headquarters,  
101 Colonel By Drive,  
Ottawa, Ontario.  
K1A 0K2

Attention: D.D.D.S. 2-2-2

Handbook for Agricultural Pilots

The International Agricultural  
Aviation Centre,  
The Hague, Netherlands.

Pest Control Products Act

Compendium of Registered Pesticides in Canada (2 Volumes)

Publishing Centre,  
Supply and Services Canada,  
Ottawa, Ontario.  
K1A 0S9

Code of Good Practice for Management of Hazardous and  
Toxic Wastes at Federal Establishments (January 1977)

Environmental Protection Service,  
Environment Canada,  
Ottawa, Ontario.  
K1A 0H3

Aerial Application of Pesticides

Environmental Health Directorate,  
Health and Welfare Canada,  
Ottawa, Ontario.  
K1A 0L2

NOTE:      The Treasury Board Standards  
and Procedures are contained  
in the Personnel Management  
Manual, Chapter 055, and in  
the Handbook of Occupational  
Health and Safety.

Application

1. This Standard applies to all Public Service departments and agencies, as defined in Part I of Schedule I of the Public Service Staff Relations Act.

Definitions

2. In this Standard

- (1) "elevated work structure" means any structure or device that is used as an elevated work base for persons or as an elevated platform for materials, and includes any scaffold, stage or staging, walkway, decking, bridge, boatswain's chair, tower, crawling board, temporary floor, any portable ladder or means of access to or egress from any of the foregoing, and any safety net, landing or other device used in connection with such a structure;
- (2) "person in charge" means a qualified person appointed to ensure the safe and proper conduct of an operation or the work of employees.

Departmental Responsibilities

3. No department shall provide or permit the use of a temporary elevated work structure where it is reasonably practicable to provide or use a permanent elevated work structure.
4. Departments shall ensure that each elevated work structure used by an employee is safe for use, and used in a safe and proper manner.
5. Employees who are required to use an elevated work structure shall be properly trained and instructed in its safe and proper use.
6. Every defect or condition that adversely affects the structural integrity of an elevated work structure shall be remedied as soon as reasonably practicable after the defect or condition is discovered.
7. An employee shall not be required or permitted to use an elevated work structure that, in the opinion of the person in charge, has a defect or condition that may expose any employee to other than the normal danger involved.

### Employee's Responsibilities

8. No employee shall use an elevated work structure unless
  - (1) authority has been received from the person in charge to use it;
  - (2) the employee has been trained and instructed in its safe and proper use; and
  - (3) the employee, or the person in charge, visually inspects the structure prior to each work shift, to ensure insofar as possible by such inspection that it is safe to use.
9. Every employee shall report to the person in charge, as soon as practicable, any defect or condition in an elevated work structure that may, in the opinion of that employee, create a hazard.
10. No employee shall use any elevated work structure that has a defect or condition that, in the opinion of that employee, may expose the employee or any other employee to other than the normal danger involved, until the structure has been examined by the person in charge and declared to be safe for use.

### Design, Construction, Installation, Maintenance and Use

11. The design, construction, installation, maintenance and use of every elevated work structure shall comply as appropriate with
  - (1) the National Building Code of Canada, 1977;
  - (2) the National Safety Council's Accident Prevention Manual, 7th Edition;
  - (3) the applicable American National Standards Institute standard; or
  - (4) any other standard that follows good industrial safety practice.

NOTE: Information concerning sources of supply, and advice relating to the foregoing data, should be obtained through the regional offices of Labour Canada.

12. Except in an emergency situation, an employee shall not be required or permitted to work on or use an elevated work structure in rain, snow, hail, or electrical or wind storms of sufficient severity to create a health or safety hazard for the employee.
13. Any elevated work structure, during its use by employees, is to be kept as free as possible of ice, snow, grease, oil or other slippery material, and of any material that may trip an employee.

14. An employee shall not work or be permitted to work from any one of the three top rungs of a single or extension ladder, or from either of the two top steps of a stepladder.
15. An employee shall not use or be permitted to use
  - (1) a ladder that provides access from one level to another level, unless it extends at least three rungs above the higher level; or
  - (2) a metal or wire-bound ladder where the employee or the ladder may come in contact with live electrical circuits or equipment.
16. All portable ladders provided for the use of employees shall be designed, constructed, inspected, tested, used and maintained in accordance with the requirements of the Canadian Standards Association standard Z11-1969, Portable Ladders, or any other standard that follows good industrial safety practice and is recommended by Labour Canada.
17. Where there is danger of materials falling from overhead, a structure shall be provided to protect any employee on the elevated work structure.
18. The open sides of any elevated work structure platform shall be equipped with a toeboard of not less than 125 mm in height, and the lower edge of such toeboard is to be flush with the floor at the outer edge of the platform.
19. Notwithstanding paragraph 18, where a toeboard would create a hazard or interfere with the proper conduct of the work, and a safe alternative means of preventing tools, materials and similar objects from falling off the platform is provided, the height of the toeboard may be reduced to not less than 25 mm.
20. Tools, equipment or materials used on an elevated work structure shall be arranged or secured in such a manner that they cannot be accidentally knocked off the structure.
21. Where vehicular or pedestrian traffic creates a hazard to an employee on an elevated work structure, the person in charge shall ensure that
  - (1) a person is posted at the base of the elevated work structure to warn vehicle operators and pedestrians; or
  - (2) there are barricades sufficient to prevent such vehicular or pedestrian traffic from coming into contact with the structure.
22. Where safety nets are required to ensure the safety of employees working on or about elevated work structures, such safety nets shall comply with ANSI Standard A10, 11-1971, Minimum Requirements for Safety Nets, or with some other standard that follows good industrial safety practice and is recommended by Labour Canada.



Application

1. This Standard applies to all Public Service departments and agencies as defined in Part I of Schedule I of the Public Service Staff Relations Act.

Scope

2. This Standard outlines certain safety requirements concerning the design, construction, use and occupancy of government-owned buildings. With respect to leased buildings occupied by Public Service employees, the requirements of this Standard shall be applied where reasonably practicable.

Definition

3. In this Standard, a "building" means any structure or enclosure and its immediate premises which is occupied, or is to be occupied, by employees.

General Responsibility

4. No employee shall use, or be required or permitted to use, any building in a manner likely to endanger the safety or health of that employee or of any other person.

Design, Construction and Alteration

5. After the effective date of this Standard, any design, construction or alteration initiated with respect to a government-owned building or part thereof shall conform, as a minimum, with the requirements of
  - (1) the National Building Code of Canada 1975, as amended from time to time;
  - (2) the Canadian Construction Safety Code 1975, issued by the Associate Committee on the National Building Code, as amended from time to time; and
  - (3) standards issued by the Dominion Fire Commissioner.
6. Plans and specifications regarding the structural safety of a new building or major alteration should, wherever practicable, be submitted to the appropriate provincial and/or municipal authority for review and comment prior to the commencement of work.

### Hot Surfaces

7. Steam and hot water pipes, heaters and any other hot surfaces having surface temperatures which could injure any person through bodily contact, shall be guarded or covered in such a manner as to prevent such direct contact.

### Doors and Windows

8. Each glass door, and every other transparent part of a building that could be mistaken for a passageway, shall be appropriately marked with conspicuous warning signs or symbols indicating the presence of the glass or transparent material.
9. Each double action swinging door used for two-way pedestrian traffic shall be designed and installed in a manner that will permit persons on either side to be seen by persons on the other side of the door.
10. Where a door or gate extending into a pedestrian or vehicle passageway may endanger the safety of persons or equipment using that passageway, appropriate warning, guarding or other measures shall be provided to facilitate the safe passage of such persons or equipment. Such measures should include the provision of a window in a door, where appropriate.
11. Where an open door, gate or other obstruction temporarily reduces the effective width of a pedestrian or vehicle passageway to less than that required for safe passage, action shall be taken by the person in charge to ensure that, while its effective width is so reduced
  - (1) a person is posted near the door or gate to warn employees of the danger; or
  - (2) barriers are placed across the passageway to prevent persons from passing while the door or gate is open.
12. With respect to exterior pedestrian and vehicle passageways, the lowest projection of any window awning, canopy or other part of a building that projects over such passageway shall be so installed as to provide adequate and safe overhead clearance for every pedestrian and vehicle using the passageway.
13. With respect to the cleaning of windows above the ground level, the American National Standards Institute standard A39.1-1969 "Safety Requirements for Window Cleaning", as amended from time to time, shall be applied.

### Floor and Wall Openings

14. All floor and wall openings shall be guarded in accordance with the American National Standards Institute standard A12.1-1967 "Safety Requirements for Floor and Wall Openings, Railings and Toe-Boards", as amended from time to time.



15. Where an employee must attend an open-top bin, hopper, vat, pit or other enclosure from a point directly above that enclosure, the person in charge shall ensure that the enclosure is
  - (1) completely covered with a grating, screen or other cover that will prevent the employee from falling into the enclosure; or
  - (2) provided with a walkway across the top.
16. Any grating, screen, covering or walkway referred to in paragraph 15 shall be designed, constructed and maintained to support a load not less than the maximum load to which it will be subjected at any time, or a live load of 125 pounds per square foot ( $6 \text{ kg/m}^2$ ), whichever is greater.
17. Every walkway referred to in paragraph 15 (2) shall be at least 20 inches (500 mm) wide, and shall be fitted with standard railings and toe-boards in accordance with the American National Standards Institute standard A12.1-1967 "Safety Requirements for Floor and Wall Openings, Railings and Toe-Boards", as amended from time to time.
18. Wherever reasonably practicable, the inside wall of all open-top bins, hoppers, vats, pits or other enclosures that are attended from above, and that are not completely covered as prescribed in paragraph 15 (1), shall be fitted with a rope ladder (which is to be secured at the top and is to extend to the bottom of the bin, hopper, vat, pit or enclosure) of sufficient strength to support a static load of at least 1000 pounds (450 kg); or a permanent ladder shall be installed.
19. Every open-top bin, hopper, vat, pit or other enclosure, the walls of which extend less than 3 feet 6 inches (1.1 m) above any adjacent floor or platform used by an employee, shall be
  - (1) covered as required by paragraph 15 (1) and clearly identified as a tripping hazard; or
  - (2) enclosed by a suitable fence or guardrail that extends at least 3 feet 6 inches (1.1 m) above any such floor or platform; or
  - (3) otherwise guarded, protected or controlled in such a manner that persons are prevented from falling into any such open-top bin, hopper, vat, pit or other enclosure.
20. Where, due to the removal of any cover, an opening is created into which persons may fall, barriers shall be securely placed around such openings to protect and warn persons of the hazard.

#### Ladders, Stairways and Ramps

21. Where any employee is required to move from one level to another level that is 18 inches (450 mm) or more higher or lower, a fixed ladder, stairway or ramp shall be provided between those levels.

22. All fixed stairways shall comply with the American National Standards Institute standard A64.1-1968 "Requirements for Fixed Industrial Stairs", as amended from time to time.
23. Every ramp, walkway, platform or safety landing shall be fitted with railings and guards as recommended in the American National Standards Institutes standard A12.1-1967 "Safety Requirements for Floor and Wall Openings, Railings, and Toe-Boards", as amended from time to time.
24. All fixed ladders shall comply with the American National Standards Institute standard A14.3-1956 "Safety Code for Fixed Ladders", as amended from time to time.
25. Where the end of a stairway is so close to a vehicular traffic route, or to a machine or other hazard, as to endanger the safety of any person using that stairway, action shall be taken
  - (1) where possible, to erect a suitable barrier that will protect employees using the stairway from the hazard; and
  - (2) to post a warning sign near the end of the stairway nearest the hazard.
26. Any fixed ladder that is more than 20 feet (6 m) long shall be fitted with a safety cage for that portion of its length that is more than 7 feet (2 m) above the base of the ladder. The safety cage shall be designed and constructed so as to prevent an employee from falling backwards or sideways off the ladder.
27. Any fixed ladder that is more than 30 feet (9 m) long shall also have, at intervals of 20 feet (6 m), a safety landing or platform that measures at least 2 feet by 2 feet (600 mm by 600 mm).
28. Paragraphs 26 and 27 do not apply to a fixed ladder that is equipped with a serviceable safety climbing device as described by the National Safety Council on Data Sheet No. 606, dated 1968, as amended from time to time.
29. Ladders installed for purposes of emergency evacuation shall be constructed and installed in accordance with the requirements of the Dominion Fire Commissioner.
30. Every ramp shall have the minimum slope that is reasonable for the purpose for which it is used. In no case shall the slope exceed the limit that is recommended by the manufacturer of the equipment that is, or will be, used on the ramp, or that will be safe under the most unfavourable condition of its use, whichever is the lesser.

#### Housekeeping and Maintenance

31. Nothing shall be left or stored in any passageway or travelled area in a manner that may endanger the safety of persons or the safe operation of vehicles moving through that passageway or area.

32. Every exterior stairway, walkway, ramp, passageway, roof and canopy shall be kept free of accumulations of ice and snow which may endanger the structure or persons. Where necessary, protection shall be provided from dangerous accumulations of ice which may fall from overhead structures.
33. All dust, dirt, waste and scrap material shall be removed from every building as often as necessary, and disposed of in such a manner that the safety and health of employees is not endangered.
34. Every travelled surface shall be maintained in such a condition that the surface is free from splinters, holes, loose floor boards or floor coverings or similar defects, and will resist slipping.
35. Electrical power vaults, switch and generator rooms or enclosures, and other similarly dangerous areas shall be kept locked or otherwise made inaccessible except to authorized persons who are qualified to safely enter or perform work in such areas.
36. Every building shall be kept in such a state of repair and maintenance as not to endanger the health or safety of any employee.

#### Illumination

37. The levels and quality of illumination in each building shall comply with the standards or requirements approved and prescribed by the Department of Public Works, or by the department or agency directly responsible for the design, construction, and maintenance of the illumination facilities.
38. Notwithstanding the requirements of the standards referred to in paragraph 37, the levels and quality of illumination shall not be less than that which, in the opinion of a safety officer of Labour Canada, is required for the maintenance of safe working and seeing conditions.

#### Emergency Lighting Systems

39. Emergency lighting systems shall be provided in every location where failure of the regular lighting system would create a condition dangerous to the safety of employees. Such lighting systems shall
  - (1) incorporate a power supply independent of that for the normal lighting system, and operate automatically in the event of an interruption of the normal lighting power supply; and
  - (2) conform to the requirements and specifications concerning Emergency Lighting Systems, issued by the Dominion Fire Commissioner.

#### Safety Codes, Practices and Procedures

40. Where, in the opinion of a Regional Director of Labour Canada, a code, procedure, practice or condition referred to in this Standard, or utilized by a department or agency, does not in certain circumstances provide a sufficient degree of safety, or may be otherwise inappropriate, he shall, in accordance with the procedures outlined in the Occupational Safety Policy for the Public Service, make recommendations to the department or agency concerning the specific safety codes or procedures to be applied. Information and advice concerning applicable safety codes or procedures, or concerning good industrial safety practices with respect to a specific situation, may be obtained from the Regional Offices of Labour Canada.

Application

1. This Standard applies to, and shall be applied by, all Public Service departments and agencies, as defined in Part 1 of Schedule 1 of the Public Service Staff Relations Act.

Scope

2. Notwithstanding the scope of other federal government Codes or Standards concerning sanitation, environmental pollution or control, this Standard is primarily concerned with occupational health. This Standard shall have application in all government-owned buildings occupied by Public Service employees. Where public servants occupy buildings not owned by the federal government, it shall be applied to the maximum extent that is reasonably practicable.

Definitions

3. In this Standard
  - (1) "change room" means a room or structure that is used by employees to change their clothes, and includes a locker room;
  - (2) "dangerous substance" means any substance that, owing to a property it possesses, is dangerous to the safety or health of any person who is exposed to it;
  - (3) "field accommodation" means accommodation, other than a permanent departmental occupancy, that is fixed or movable living, eating, changing or sleeping quarters provided for employees at a work location;
  - (4) "food service area" means any area that is used for the storage, handling, preparation or serving of food;
  - (5) "lunchroom" means a room that is primarily used by employees for eating food brought into the premises;
  - (6) "personal service room" means a change room, toilet room (excluding outdoor toilets), washroom, shower room, lunchroom, living space, sleeping quarters or any combination thereof;
  - (7) "potable water" means water of a quality which satisfies the standards or requirements of Health and Welfare Canada for drinking water;
  - (8) "sanitary facility" means a toilet or personal cleansing facility, and may include a toilet, urinal, wash basin and shower bath;
  - (9) "vermin" means any insect or rodent pest.

### General Responsibilities

4. Departments are responsible for ensuring that the requirements of this Standard are applied, and that each sanitary facility, personal service room and food service area is used and maintained in such a manner as to ensure that it remains in a clean and sanitary condition at all times.
5. Persons who use a sanitary facility, personal service room or food service area shall use it in such a manner that it will remain clean and in a sanitary condition.

### Care of Premises

6. All janitorial or other work that may cause dusty or unsanitary conditions shall, to the extent that is reasonably practicable, be performed after normal working hours.
7. All cleaning, sweeping and other activities shall be carried out in a manner that will minimize contamination by dust or other injurious substances, and in a manner that will not cause slippery or hazardous conditions.
8. Dirt and waste material shall not be allowed to accumulate to such an extent that unsafe or unsanitary conditions result.
9. Each sanitary facility and personal service room shall be cleaned at least once each 24-hour period following its use by employees.
10. Every receptacle that is used, in relationship to the care of premises, for the storage of putrescible solid or liquid waste shall be leak-proof, equipped with a tightly fitted cover, and so constructed that it can easily be cleaned and maintained in a sanitary condition.
11. Every receptacle referred to in paragraph 10 shall, where necessary, be so designed that internal pressure is relieved by controlled venting.
12. Each enclosed part of a work area, each personal service room area and each food service area shall be located, constructed, equipped, maintained and isolated in such a manner as to prevent the entrance and harbourage of vermin and animals as well as dangerous substances.
13. Where vermin have entered any enclosed part of an area referred to in paragraph 12, immediate action shall be taken for their elimination and control and for restoration of the area to a sanitary condition.
14. No person shall use a personal service room for the purpose of storing any material unless that material is related to the use of that room and is stored in a proper closet fitted with a door and which is provided in that room for that purpose.

15. With respect to each personal service room and food service area:
- (1) the floors, partitions and walls shall have a durable, water-resistant finish and be so constructed that they can be easily washed and maintained in a sanitary condition; and
  - (2) the floor, and the lower 150 mm of any walls and partitions that are in contact with the floor, shall, in any food service area or room that contains a sanitary facility, be watertight and impervious to moisture, and the joint between the walls and the floor shall be coved.
16. Paragraph 15(2) does not apply to a food service area or to a sanitary facility that was installed before the effective date of this Standard if the floor can be maintained in a sanitary condition.

#### Plumbing Systems

17. The plumbing system necessary for the supply of potable water and for the removal of water-borne waste shall comply with the National Building Code of Canada, 1980, or, where appropriate, Canadian Standards Association standard Z-240.3.1-M1980 "Plumbing Requirements for Mobile Homes", or a standard that is equivalent or superior to the standards referred to in this paragraph.
18. Where, in accordance with the requirements of this Standard, a sanitary facility is required on departmental premises, the sanitary facility shall be connected to a municipal sanitary sewer or water main or to both, where it is reasonably practicable to do so, in accordance with the applicable provincial environmental standard or code governing such installations, or the Environment Canada guidelines (EPS-1-EC-76-1) where no such provincial standard exists, or is less stringent.
19. Where a sanitary facility is required and a municipal sewer or water system, or both, are not available, a sewer or water system, or both, as the case may be, shall be installed in accordance with the provincial environmental standard or code governing such installations, or the Environment Canada guidelines (EPS-1-EC-76-1) where no such provincial standard exists, or is less stringent.

#### Toilet Facilities

20. The number of toilet facilities shall, as a minimum, be in accordance with the provisions of the National Building Code of Canada, 1980.
21. To the extent that it is reasonably practicable, a toilet room shall be located not more than sixty metres, measured horizontally from, and not more than one storey above or below, every work site.

22. Where toilet facilities are provided for employees of each sex, the maximum number of employees of each sex means the number of each sex usually at the workplace on any one shift, but does not include employees who are employed away from the workplace for more than 75 per cent of the time.
23. Notwithstanding paragraph 20, where more than one toilet is required for male employees, urinals may be provided in place of not more than one-half the number of toilets required.
24. Where it is not reasonably practicable to install a water closet-type toilet connected to a sewage disposal system, a chemical recirculating or combustion toilet or an outdoor "privy" may be installed, provided the facility is constructed and maintained in accordance with the American National Standards Institute standard Z4.3-1970, "Minimum Requirements for Non-water Carriage Disposal Systems", or another standard acceptable to Health and Welfare Canada.
25. There shall be an adequate supply of toilet paper, with a holder, in each toilet compartment, and a covered receptacle for the disposal of sanitary pads shall be provided in each toilet room used by female employees.

#### Washrooms and Wash Basins

26. Subject to the provisions of paragraph 30, at least one wash basin with a supply of water, including hot water, where practicable, shall be provided in every room containing one or two toilets or urinals, and at least one additional wash basin with a supply of water shall be provided for every two additional toilets or urinals.
27. The following minimum requirements shall be adhered to wherever washing facilities are provided:
  - (1) soap or another acceptable skin-cleansing agent shall be provided in a suitable dispenser adjacent to each wash basin or shower;
  - (2) paper or cloth towels (continuous cloth towelling shall not be used) shall be provided in each washroom in sufficient quantities to adequately serve the number of employees using the washroom; and
  - (3) separate non-combustible receptacles shall be provided for the disposal of used cloth towels and paper towels.
28. Where hot water is provided for washing purposes, it shall be maintained at a temperature of not less than 38° C, and in no case shall water be heated by mixing it with steam.
29. Where an outdoor privy, chemical or other toilet is provided, washing facilities shall be located as close to it as reasonably practicable.



30. Notwithstanding the provisions of paragraph 26, where employees may be exposed to skin contamination from toxic, infectious, irritating or noxious substances which are potential safety or health hazards, a wash-room with individual wash basins supplied with both hot and cold water shall be provided near the workplace, as follows:

<u>Number of Employees</u>	<u>Number of Wash Basins</u>
1 to 5	1
6 to 10	2
11 to 15	3
16 to 20	4
More than 20	4, plus 1 for every 15 employees, or portion thereof, in excess of 20.

31. Industrial wash troughs or circular wash basins may be used in place of the required individual wash basins, if they provide equivalent facilities for personal cleansing purposes.
32. A wash basin shall not be installed nearer than 600 mm from any toilet or urinal unless it is separated from the toilet or urinal by a waterproof partition.

#### Showers and Shower Rooms

33. A shower room with at least one shower bath for every 10 employees or proportion of that number on a work shift shall be provided for the use of those employees who, during the course of their duties, are regularly exposed to body contamination by toxic, infectious, irritating or any other substances hazardous to safety or health.
34. Shower stalls shall be constructed of non-porous material which can be maintained in a sanitary condition and shall be provided with an adjustable supply of hot and cold water which discharges through a single shower head.
35. Soap or another approved cleansing agent shall be made available, and for each occasion that an employee is required to take a shower, a clean towel shall be provided.

#### Ventilation

36. Each personal service room and each food service area which was constructed before January 1, 1976, shall be ventilated in such a manner as to provide at least eight changes of air per hour.

37. Each personal service room and each food service area that was constructed, expanded or significantly modified on or after January 1, 1976, shall be ventilated
- (1) by mechanical means, where the room is used by 10 or more employees; or
  - (2) by mechanical means or natural ventilation through a window or similar opening, where the room is used by less than 10 employees if
    - (a) the window or similar opening is located on an outside wall of the room, and
    - (b) not less than  $2000 \text{ cm}^2$  of unobstructed opening is provided for each employee who normally uses the room at any one time.
38. Where the ventilation of a personal service room is by mechanical means, pursuant to paragraph 37(1), and that room contains lockers, showers or sanitary facilities, the amount of air provided shall be not less than that specified in Table 1.
39. Where the ventilation of a food service area or a lunchroom is by mechanical means, pursuant to paragraph 37(1), the rate of change of air shall be not less than 9 L/s for each employee who is normally employed in the food service area at any one time or for each employee who uses the lunchroom at any one time, as the case may be.
40. An exhaust system from a personal service room containing a sanitary facility shall be connected in such a manner that an exchange of air from the personal service room to another room cannot occur at any time.

#### Potable Water

41. Only potable water shall be used for drinking. Water that is not potable water shall not be used for washing.
42. Where it is necessary to transport water for drinking or washing, only sanitary containers and sanitary methods of handling the water shall be used.
43. Wherever a storage container for drinking water is used it shall be
- (1) securely covered and closed;
  - (2) used only for the purpose of storing potable water;
  - (3) maintained in a sanitary condition;

- (4) used in such a way that, when water is drawn from the container, the water does not become contaminated; and
  - (5) disinfected in a manner approved by Health and Welfare Canada at least once each 7 days while in use, and before the container is used following storage.
44. Except where drinking water is provided by a fountain, there shall be provided
- (1) an adequate supply of single-use drinking cups in a sanitary container located near the water container; and
  - (2) a non-combustible covered receptacle for the disposal of used drinking cups.
45. The use of a common drinking cup is prohibited.
46. Ice that is added to drinking water or used for the contact refrigeration of foodstuffs shall be made from potable water and shall be stored and handled so as to prevent it from becoming contaminated. Ice handling equipment, as well as the storage area, should be regularly disinfected.
47. Where drinking water is supplied by a fountain
- (1) the requirements of American National Standards Institute standard A112.11.1-1973, "Drinking Fountains and Self-contained Mechanically Refrigerated Drinking Water Coolers", shall be met; and
  - (2) the fountain shall not be installed, subsequent to the effective date of this Standard, in a personal service room containing a toilet.

#### Clothing Storage

48. Change rooms shall be provided where
- (1) the nature of the work engaged in by an employee makes it necessary for the employee to change from street clothing to work clothing for safety or health reasons; or
  - (2) an employee is normally engaged in work in which the employee's clothing becomes wet or contaminated by a dangerous substance to the extent that it could constitute a health or safety hazard to that employee or other persons.
49. To the extent that is reasonably practicable, a clothing change room shall be located
- (1) near the workplace and connected thereto by a completely covered route to the workplace;

- (2) near a shower room provided pursuant to paragraph 33; and
  - (3) near a toilet room.
50. Where contaminated work clothing referred to in paragraph 48(2) is changed, it shall be stored, handled or disposed of in such a manner that the contaminant does not come in contact with uncontaminated clothing.
51. Departments shall ensure that employees do not wear away from the workplace any clothing that has been contaminated.
52. Facilities shall be provided or arrangements shall be made to clean, to the extent required for decontamination, and to dry such clothes before they are worn again.

#### Lunchrooms

53. No person shall eat, prepare or store food
- (1) in a place where a dangerous substance is likely to contaminate food, dishes or utensils;
  - (2) in a personal service room that contains a toilet, urinal or shower bath; or
  - (3) in any place which, according to Health and Welfare Canada, is unsuitable for this purpose.
54. Where a lunchroom is provided for employees
- (1) it shall be physically separated or isolated from any place where there is a possibility of contamination by dangerous substances;
  - (2) it shall not be used for any purpose that is incompatible with its use as a lunchroom;
  - (3) it shall be provided with non-combustible, covered receptacles for the disposal of waste food or other waste material; and
  - (4) dishes or other food utensils shall not be washed in lavatory or sanitary facility wash basins.

#### Field Accommodation

55. A field accommodation shall not be used as such unless
- (1) it is so constructed that it can be adequately cleaned and disinfected;
  - (2) the food service area and the lunchroom are separately partitioned from the sleeping quarters;

- (3) where a potable water plumbing system is provided, such system complies with the requirements of Health and Welfare Canada;
  - (4) sewage, refuse and garbage disposal facilities are provided; and
  - (5) all such accommodation, including sanitary facilities, is located, constructed and maintained in a clean and sanitary condition.
56. Departments shall ensure that, in any field accommodation used for sleeping quarters,
- (1) a separate bed or bunk is provided for each occupant;
  - (2) the beds or bunks provided are not more than double-tiered and are so constructed that they can be adequately cleaned and disinfected;
  - (3) all mattresses, sheets, pillows, pillow cases, blankets, sleeping bags and bed covers are maintained in a clean and sanitary condition and are regularly inspected under the responsibility of the person in charge at the location;
  - (4) clean laundered sheets and pillow cases are, under normal circumstances, supplied to each occupant at least once each week;
  - (5) blankets are laundered at least once every three months of normal use, or upon a change of bed occupant; and
  - (6) a locker capable of being locked and at least one shelf in addition to the locker are provided for each bed or bunk.
57. An environmental health officer of Health and Welfare Canada may direct that additional or other measures be taken, where required, in order to maintain sanitary and healthful conditions in a field accommodation.

#### Food Preparation, Storage and Serving of Food

58. The storage, supply and handling of food shall comply with the Sanitation Code for Canada's Food Service Industry, issued by the Canadian Restaurant Association, Toronto, dated November 1975.

#### Health/Medical Authority

59. Where, in the opinion of an authorized official of Health and Welfare Canada, a code, procedure or condition referred to in this Standard, or utilized by a department or agency, does not provide a sufficient degree of health protection, or may otherwise be inappropriate, he or she may make directions in writing to the department or agency concerning the specific codes or procedures to be applied.

60. Information or advice concerning applicable codes, procedures and good industrial sanitation and health practices with respect to a specific situation may be obtained from the appropriate Regional Medical Services Office of Health and Welfare Canada.

Accommodation Standards

61. Information concerning accommodation data may be obtained through Public Works Canada.

TABLE 1

Ventilation for locker rooms,  
shower spaces and toilet spaces

Column 1 <u>Type of location</u>	Column 2 <u>Minimum Requirements</u>
1. Locker rooms:	
(a) change room for employees with clean work clothes.	(a) 5 L/s per m <sup>2</sup> of floor area.
(b) change room for employees with wet or sweaty clothes.	(b) 10 L/s per m <sup>2</sup> of floor area; 3 L/s exhausted from each locker.
(c) change room for employees who work or clean where clothes will be wet or where clothes will pick up heavy odours.	(c) 15 L/s per m <sup>2</sup> of floor area; 4 L/s exhausted from each locker.
2. Shower spaces	10 L/s per m <sup>2</sup> of floor area. At least 20 L/s per shower head, 90 L/s minimum for shower spaces.
3. Toilet spaces	10 L/s per m <sup>2</sup> of floor area. At least 10 L/s per sanitary facility, 90 L/s minimum for toilet spaces.





## PROCEDURES



## PROCEDURES

### Introduction

This section contains a number of procedural directives relative to the administration of health and safety programs in the Public Service of Canada. Apart from providing special criteria for certain activity areas, they prescribe common courses of administrative action which have been adopted for these programs.

Departments and agencies are required to ensure that these procedures are incorporated and applied, as appropriate, in their employee health and safety programs.



### Application

1. These Procedures apply to Public Service departments and agencies, as defined in Part I of Schedule I of the Public Service Staff Relations Act. Departments may also be required to comply with other applicable procedures or requirements such as those specified by the Dominion Fire Commissioner, the Atomic Energy Control Board, the Government Employees Compensation Act, or as prescribed in Public Service Occupational Health and Safety Standards.

### Definitions

#### 2. In these Procedures

- (1) "accident" means an event which results in an occupational injury, property damage or material loss (material loss in this case does not include loss resulting from fire, or non-accidental causes such as theft);
- (2) "disabling injury" means an occupational injury or an occupational illness which requires professional medical attention and which, according to medical authorization, prevents the employee from returning to work for the next regular shift or subsequent workday;
- (3) "first aid" means treatment or care of occupational injuries and illnesses provided pursuant to the First Aid Standard, TB STD 3-5;
- (4) "non-disabling injury" means an occupational injury or occupational illness which requires professional medical treatment, but does not require the employee to be absent from work beyond the day or shift on which such injury or illness occurred;
- (5) "occupational illness" means any disease, abnormal health condition or disorder, other than one resulting from an occupational injury, caused by exposure to environmental factors or substances associated with the work, and which includes acute and chronic illnesses or diseases which may result from inhalation, absorption, ingestion or direct contact with a substance;
- (6) "occupational injury" means any bodily injury (such as a cut, fracture, sprain, amputation, etc.,) which results from a work accident or from an exposure involving a single incident in the work environment.

### Departmental Responsibilities

3. Each department and agency is responsible for ensuring that work accidents occurring within its jurisdiction are, in accordance with these Procedures, investigated, recorded and reported, the causes determined, and appropriate measures taken to prevent similar occurrences. Accordingly, departmental directives and procedures shall be established and maintained to ensure that
  - (1) an effective investigation of each work accident is, in accordance with paragraphs 9 and 10, conducted and completed within seven working days of the occurrence, and the cause or causes determined;
  - (2) prompt action is taken to effect, to the extent that is reasonably practicable, recommended changes in physical conditions or work procedures arising from such investigations; and
  - (3) the required recording and reporting procedures are followed.

### Employee Responsibilities

4. Employees shall be appropriately advised that each work accident or occupational illness must be reported to the person in charge as soon as possible after the occurrence, and the employee shall be required to co-operate fully in any related investigation.

### Accident Investigation

5. The responsibility for ensuring the effective conduct of accident investigations, including the determination of the cause and the execution of the approved corrective measures, rests with the supervisor in charge of the work being performed at the time of the accident.
6. The assistance of technical specialists should be utilized where required in the conduct of an investigation.
7. Safety representatives located in the Regional Offices of Labour Canada are available to provide technical advice or assistance in such investigations, and may, in accordance with the Occupational Safety Policy for the Public Service, carry out an investigation of any accident.
8. All fatal injuries, other than those attributable to motor vehicle or aircraft operations, shall, insofar as is practicable, be investigated by Labour Canada. Fatal injuries arising out of motor vehicle or aircraft operations may, however, be investigated by Labour Canada if that department considers that non-operational factors are involved.
9. A formal investigation shall be carried out and a Supervisor's Accident Investigation Report completed in the case of every work accident (as defined in these Procedures) which results in

- (1) a fatal injury;
  - (2) a disabling injury;
  - (3) any occurrence which requires rescue, revival or other emergency measures, or occurrences which cause an employee to lose consciousness, such as exposure to an oxygen-deficient or toxic atmosphere, or electrical shock;
  - (4) property damage and/or material loss (including damage to mobile equipment), the repair or replacement of which is estimated to cost \$500.00 or more.
10. In the case of the following categories of work accidents or injuries, detailed procedures respecting the method and extent of investigation shall be determined according to the requirements of each department:
- (1) non-disabling injuries;
  - (2) accidents causing property damage or material loss, the cost of which is estimated to be less than \$500.00;
  - (3) any other incident or occurrence, the circumstances of which could have resulted in a disabling injury or property damage/material loss of \$500.00 or more.

#### Distribution of Supervisor's Accident Investigation Reports

11. Copies of the Supervisor's Accident Investigation Report shall be distributed to appropriate levels of management, safety and health committees, safety officers, and elsewhere according to the safety program requirements of the department.
12. One copy of each Report of the accidents specified in paragraph 9 (1), (2) and (3) shall be forwarded to the appropriate District or Regional Office of Labour Canada as soon as possible following completion of the accident investigation.
13. Departments shall inform the appropriate District or Regional Office of Labour Canada of any fatal accident within 24 hours of its occurrence.

#### Records

14. Departments shall develop and implement procedures and systems for the provision of data concerning employee injury/accident experience, as follows:

- (1) Record of First Aid Treatment

A record of all occupational injuries and illnesses that require first aid treatment shall be maintained for at least one year

following the first aid. (Copies of a "First Aid Attendant's Treatment Record Book" are available for this purpose through reference to Supply and Services Catalogue No. 7530-21-852-9254.)

(2) Individual Accident/Injury Record

A concise record of the essential details of each occupational injury or illness (excluding first aid) may be maintained at appropriate responsibility centres, as determined by departments, to provide a convenient monitoring reference. ("Individual Accident/Injury Record" forms suitable for use are available through reference to Supply and Services Catalogue No. 7540-21-029-0179.)

(3) Supervisor's Accident Investigation Report

A Supervisor's Accident Investigation Report shall be completed in accordance with paragraph 9 and copies distributed as outlined in paragraphs 11 and 12. ("Supervisor's Accident Investigation Report" forms, TB 330-10, suitable for this purpose are available through reference to Supply and Services Catalogue 7540-21-029-0158.)

- (4) Departments may specify use of a different Supervisor's Accident Investigation Report form designed for individual departmental use, if it provides, as a minimum, the information required on form TB 330-10.

Statistics

15. Appropriate data respecting work accidents and injuries shall be maintained by each department to provide details respecting accident trends, locations and causes and to serve as a basis for monitoring accident experience. Statistical summaries are to be compiled at least semi-annually and departments shall specify the detailed format, scope and distribution of such statistics and summaries in order to reflect internal needs. These records shall, however, include, as a minimum, the following data:

- (1) the number of disabling injuries and non-disabling injuries;
- (2) the number of injuries (disabling and non-disabling) per 100 employee-years (1 employee-year  $\frac{1}{2}$  2,000 hours);
- (3) the total number of working days lost;
- (4) the number of working days lost per 100 employee-years;
- (5) the number of individual accidents involving property damage or material loss of \$500.00 or more, and the total cost of all such accidents.



Posters Outlining Procedures in Case of Work Injury

16. An outline of the basic procedures which shall be followed in case of work injury has been consolidated in the form of a poster for use on bulletin boards, as described in Table 1. Departments shall reproduce the wording of this poster in any format required, and arrange to have it posted conspicuously at all workplaces.

TABLE 1  
PUBLIC SERVICE OF CANADA  
IN CASE OF WORK INJURY

MANAGERS are required to ensure that

- . first aid treatment is available to employees in accordance with Public Service Standards, and that details of each treatment are recorded;
- . each work injury that requires professional medical attention is recorded, and reported within 72 hours of its occurrence in accordance with procedures specified in the Employers' Guide to Procedures under the Federal Government Employees Compensation Act;
- . each Workmen's Compensation Injury Report Form is completed in detail and signed by the foreman, supervisor or other responsible person in charge;
- . in addition to reporting for compensation purposes, accidents are investigated and reported in accordance with Public Service requirements and procedures.

EMPLOYEES are required to

- . obtain first aid treatment promptly;
- . report each work injury to the person in charge as soon as possible after its occurrence;
- . notify the person in charge when it is necessary to leave the workplace to obtain routine medical treatment;
- . notify the person in charge as soon as possible after initial medical treatment has been obtained outside of normal working hours.

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This form should be posted in a conspicuous place accessible to all employees.

### Introduction

1. Under the Public Service Occupational Health Policy, an important aspect of the Public Service health program concerns the provision of a program and procedures for the surveillance of work facilities in order to identify and promptly correct hazards which may adversely affect the health of employees. Where a health hazard is suspected or deemed to exist, qualified personnel should be available to determine the type and extent of the hazard, if any, and, where necessary, to recommend measures that will eliminate or reduce the hazard.
2. Accordingly, the Treasury Board, pursuant to its authority under Section 7 of the Financial Administration Act, has authorized these Procedures concerning the investigation and surveillance of occupational health hazards in the Public Service.

### Application

3. These Procedures apply to all Public Service departments and agencies, as defined in Part I of Schedule I of the Public Service Staff Relations Act.

### Definitions

4. In these Procedures
  - (1) "Director" means the Regional or Zone Director of Medical Services Branch, Health and Welfare Canada, or another official authorized to act on the Director's behalf;
  - (2) "environmental health officer" means an individual so designated by Health and Welfare Canada, and whose responsibilities relative to these Procedures are detailed in Table 1;
  - (3) "investigation" means the detailed examination of a work process, condition or facility, either in response to a specific request or incident, or as part of the overall program, in order to determine the existence, extent and type of a health hazard;
  - (4) "occupational health hazard" means an identifiable hazard to employee health which is capable of causing an occupational illness, and generally falls into one of the following categories:
    - (a) chemicals: liquids, gases, dusts, fumes, mists and vapours;
    - (b) physical: ionizing and non-ionizing radiations, noise, vibration, sanitation, ventilation and extremes of temperature and pressure; and

(c) biological: insects, mites, moulds, yeasts, fungi, viruses and bacteria;

- (5) "occupational illness" means any disease, abnormal health condition or disorder, other than one resulting from an occupational injury, caused by exposure to environmental factors or substances associated with the work, and which includes acute and chronic illnesses or diseases which may result from inhalation, absorption, ingestion or direct contact with a substance;
- (6) "occupational injury" means any bodily injury (such as a cut, fracture, sprain, amputation, etc.,) which results from a work accident or from an exposure involving a single incident in the work environment;
- (7) "survey" means the pre-planned and systematic study or review of working conditions and facilities to identify and evaluate potential health hazards.

#### Responsibilities

- 5. Departments and agencies shall, in accordance with these Procedures, be responsible for
  - (1) initiating protective measures, as required, and maintaining ongoing conditions necessary to protect employees from exposure to health hazards at work;
  - (2) formally requesting Health and Welfare Canada to undertake occupational health investigations whenever health hazards are suspected;
  - (3) affording environmental health officers access to work locations at all reasonable times; and
  - (4) implementing recommendations made as a result of investigations and surveys.
- 6. Health and Welfare Canada is responsible for
  - (1) ensuring, insofar as is practicable, the availability of qualified personnel to carry out the program;
  - (2) undertaking, in liaison with the departments concerned, health investigations or surveys and providing necessary direction to departments for the elimination or reduction of health hazards in the workplace;
  - (3) monitoring compliance with recommendations or directions issued;

- (4) maintaining close liaison with Labour Canada in all regions and, where appropriate, utilizing that department's technical support and expertise, and reacting to referrals concerning health hazards which are received from that department;
- (5) maintaining ongoing research and the development of occupational health procedures and related exposure limits to dangerous substances or other occupational health hazards.

#### Criteria

7. The criteria which govern general health conditions, types and levels of exposure, and the exposure thresholds pertaining to dangerous substances, shall be as determined through reference to Public Service Occupational Health and Safety Standards approved and issued by the Treasury Board or, where not so covered, in accordance with standards or criteria recommended by Health and Welfare Canada.

#### Procedures for Requesting an Investigation

8. The investigation and survey program is intended to augment departmental responsibilities and initiatives for the ongoing detection and elimination of hazardous or unhealthy conditions. Apart from individual responsibilities in this regard, such conditions may also be delineated through the action of joint management-labour safety committees. Where a potential health hazard is suspected, departments should, in the first instance, utilize and consult with local experts and specialists concerning the matter.  
Investigations should not be requested frivolously, or carried out in respect of conditions which do not involve occupational health hazards, as defined in these Procedures.
9. In the event that an occupational health hazard is suspected, a written request, authorized and signed by a responsible departmental official, shall be forwarded to the applicable Director. Departmental requests shall include the following information:
  - (1) the location and description of the facility to be investigated;
  - (2) the general nature of the suspected health hazard; and
  - (3) the name, address and telephone number of the departmental official to be contacted.
10. If an employee believes that he or she may be subject to hazardous working conditions that could cause an occupational illness, whether such hazard is considered to be imminent or not, the employee may request that the person in charge arrange for an investigation of the hazard as soon as possible. Following confirmation that a formal investigation within the scope of these Procedures is required, the person in charge shall make the necessary arrangements through the responsible departmental official.

11. Upon receipt of a departmental request, the Director will, in liaison with the department concerned, schedule the investigation and advise the department accordingly.

#### Distribution of Reports

12. Upon completion of an investigation or survey, a written report shall be prepared by the environmental health officer and forwarded under the authority of the Director to the departmental official concerned. Directions concerning the implementation of recommendations should be specified, as required.
13. One copy of each report shall also be forwarded to the
  - (1) Senior Consultant, Public Service Health, Medical Services Branch, Health and Welfare Canada, Ottawa;
  - (2) Chief, Occupational Health and Safety Group, Personnel Policy Branch, Treasury Board, Ottawa; and
  - (3) appropriate Regional Director of Labour Canada.
14. Departments shall ensure the appropriate internal distribution of investigation and survey reports. Pursuant to paragraph 10, an employee requesting an occupational health investigation shall be afforded the opportunity to review the investigation report.

#### Implementation Procedures

15. Changes or measures recommended as a result of investigations or surveys shall be implemented by departments as soon as is practicable. The appropriate Director shall be advised when compliance has been effected, and also where an appreciable delay is foreseen in the implementation of recommendations.

#### Procedures in the Case of Imminent and Serious Danger

16. Where, in the opinion of an environmental health officer, a situation poses both an imminent and serious danger to the health of employees, the department shall be directed to take the required immediate action to rectify or remove the imminent and serious danger. If the imminent and serious danger cannot be immediately rectified or satisfactorily reduced, the environmental health officer shall contact the appropriate Director who shall decide whether or not to order suspension of the operations related to the imminent health danger until the condition has been rectified or the degree of danger satisfactorily reduced.
17. Where a suspension order has been issued, it shall be the responsibility of Health and Welfare Canada, Medical Services Branch, to immediately notify the Personnel Policy Branch of the Treasury Board Secretariat and the Deputy Head of the department or agency concerned of the suspension order.

18. If a department or agency considers that a suspension order is not warranted, it shall comply with the order, but may immediately request the Director to review the department's objectives, and, if the matter is not mutually resolved, the department may appeal directly to the Occupational Health and Safety Group of the Personnel Policy Branch of the Treasury Board Secretariat, which will rule on the matter.

#### Ongoing Surveillance Program

19. In addition to investigations carried out in response to specific departmental requests, Health and Welfare Canada will also undertake, under the authority of these Procedures and the Public Service Occupational Health Policy, an ongoing survey program of occupational health hazards at locations where such health hazards are deemed to exist. Surveys shall be carried out in accordance with priorities and schedules established by the appropriate Director. Such survey activity shall be closely coordinated at the regional level with Public Service safety inspection activities scheduled by Labour Canada.
20. The requirements of these Procedures shall apply to this ongoing surveillance program (as outlined in paragraph 19) in all respects.

TABLE I

ENVIRONMENTAL HEALTH OFFICER - RESPONSIBILITIES

1. The environmental health officer shall, with the assistance of other health specialists, as required
  - (1) conduct, on behalf of the Director, occupational health investigations or surveys to determine
    - (a) the occupational health hazards which may prevail at work locations;
    - (b) the scope and seriousness of these hazards, and their effect in impairing the health and well-being of employees; and
    - (c) the measures required to eliminate or control these hazards, or to reduce their effects to an acceptable level.
  - (2) interpret and analyse the results of health investigations and surveys.
  - (3) recommend control methods and procedures, where necessary, which will be suitable and effective for adequate employee protection.
  - (4) prepare and forward, under the authority of the Director, a detailed report on each investigation or survey which includes:
    - (a) date or period conducted;
    - (b) location and description of facility;
    - (c) name of departmental official contacted;
    - (d) nature of problem;
    - (e) activities carried out;
    - (f) tests conducted;
    - (g) findings;
    - (h) formal recommendations;
    - (i) suggested improvements.
  - (5) bring to the attention of the Regional Director of Labour Canada, or the Regional Fire Commissioner, or other departments or agencies with particular jurisdictions in the area of health, those matters which come under the jurisdiction of these departments or agencies.



Introduction

1. Inhalation of asbestos fibres can result in adverse health effects to those exposed. These Procedures, which are issued pursuant to the Dangerous Substances Safety Standard, TB STD 3-2, are intended, therefore, to provide an outline of basic health and safety measures for the protection of employees exposed to an asbestos process.

Application

2. These Procedures apply to all Public Service departments and agencies, as defined in Part I of Schedule I of the Public Service Staff Relations Act.

Definitions

3. In these Procedures

- (1) "asbestos" includes any of the minerals crocidolite, amosite, chrysotile, anthophyllite, tremolite or actinolite;
- (2) "asbestos process" refers to any handling of materials containing asbestos, including
  - (a) the sawing, cutting, drilling or abrasion of asbestos materials;
  - (b) the packing or unpacking of asbestos;
  - (c) the installation or removal of asbestos insulation or coverings;
  - (d) the mixing or application of asbestos cements, plasters, putties or similar compounds;
  - (e) the cleaning of asbestos-contaminated clothing;
  - (f) the storage, conveyance or disposal of materials containing asbestos; or
  - (g) any surface maintenance of asbestos materials that causes the release of asbestos fibres.

Departmental Responsibilities

4. Departments and agencies shall
  - (1) avoid the use or processing of asbestos if it is reasonably practicable to substitute a less hazardous substance;

- (2) ensure that every asbestos process under their jurisdiction is identified, and that each such process is carried out and controlled in compliance with the requirements of these Procedures;
- (3) notify the appropriate Regional or Zone Director of the Medical Services Branch, Health and Welfare Canada, concerning the details of every existing and new asbestos process under their jurisdiction;
- (4) ensure that every employee involved in an asbestos process is familiar, and complies in an appropriate manner, with the requirements of these Procedures.

#### Control of Airborne Asbestos Dust

5. No asbestos process shall proceed without appropriate control measures such as ventilation, separate enclosure or isolation of the process from workers, to minimize the hazardous dispersal of asbestos dust into the work environment. Advice concerning specific control measures may be obtained by contacting the Regional Office of Labour Canada or the appropriate Regional Medical Services Office of Health and Welfare Canada.
6. Wet or damp processing of asbestos should be instituted wherever possible.
7. Ventilation equipment used for controlling and removing asbestos dust shall be maintained, operated and periodically tested by a competent person to ensure that it continues to operate at design performance in order that the asbestos content of the breathing zone will not exceed the threshold limit value.

#### Personal Protective Equipment

8. Where it is not practicable to control asbestos dust within the required threshold limit value as specified in paragraph 17, or there are doubts concerning the safety of existing dust levels, the use of personal protective equipment and clothing is required. In such instances, the department shall provide and ensure that each exposed person uses a respirator of a type recommended by Health and Welfare Canada that is appropriate for the required degree of respiratory protection, and any special protective work clothing which may be required.
9. Every person who is required to wear personal protective equipment must be fully instructed in the proper use, care and maintenance of that equipment.
10. Special protective work clothing shall be worn only in the workplaces or operations for which such clothing is designated. A change room that is suitable for changing into and out of protective work clothing and for clean storage of street clothes shall be provided for the use of employees who work with asbestos. Protective clothing that has been exposed to asbestos should not be taken home by the employee.

11. Departments shall arrange for the laundering of such protective clothing, which must be done in a segregated manner. Clothing that is being laundered or sent for laundering must be separated, identified and handled in a manner that does not expose laundry workers to the asbestos hazard.

#### Cleanliness of the Workplace

12. Accumulations of asbestos waste or dust produced in any place of employment must be removed at least once daily; heavy accumulations of such waste or dust must be removed as frequently as is reasonably practicable during a work shift.
13. All cleaning to remove asbestos waste or dust shall be performed by vacuum or wet cleaning methods to prevent the dispersal of asbestos dust into the environment, and shall be both collected and disposed of in closed containers.

#### Health Surveillance

14. All employees, regardless of duties or mode of protection, who are regularly exposed to an asbestos process shall be medically examined annually through the facilities of Health and Welfare Canada.
15. Such examinations shall be carried out in accordance with the Periodic Health Evaluations Standard, TB STD 3-13, and shall consist of a Category III level assessment, including a chest X-ray and pulmonary function tests. Health and Welfare Canada shall maintain detailed records of all employees whose health has been adversely affected through exposure to asbestos, and shall advise the employing department and the Treasury Board of such cases.
16. Employees involved in an asbestos process shall be routinely informed by their department of all known asbestos hazards, and of the corresponding need to develop safe and healthful work and personal habits. Advice and information concerning such risk factors may be obtained through Health and Welfare Canada.

#### Environmental Surveillance

17. The "threshold limit value" is the eight-hour time-weighted average airborne concentration of asbestos fibres (not exceeding two fibres longer than five micrometers per cubic centimetre of air) to which a person may be exposed.
18. Air samples shall be taken at a frequency to be specified by Health and Welfare Canada. Samples shall be collected from within the breathing zone of the employees, using membrane filters of 0.8 micrometer porosity, mounted in an open-face filter holder. Determinations will be made at a magnification of 400 to 500 using phase contrast illumination.

19. Employees shall not be exposed to ceiling concentrations of more than 10 asbestos fibres (longer than 5 micrometers) per cubic centimeter of air, as determined by a minimum sampling time of 15 minutes.
20. All sampling methods and techniques shall be carried out according to a procedure outlined and approved by Health and Welfare Canada.

Application

1. These Procedures are issued pursuant to the Materials-Handling Safety Standard, TB STD 3-10, and are intended to provide a basic outline of the principal safety factors and requirements respecting tractors and their operation. They are to be applied by Public Service departments and agencies, as defined in Part I of Schedule I of the Public Service Staff Relations Act.

Definition

2. In these Procedures, a "tractor" means a vehicle designed for agricultural or industrial use which is used to pull, carry, propel or drive agricultural implements; and for landscaping, loading, digging, groundskeeping, highway maintenance and construction services. Tractors used in the servicing or towing of aircraft are not included.

General Responsibilities

3. Departments and agencies are, in accordance with the general principles set forth in these Procedures, responsible for
  - (1) developing and enforcing detailed departmental rules and procedures for the safe operation of tractors, including instructions and procedures for the avoidance of roll-over;
  - (2) ensuring that every tractor is maintained in a safe operating condition;
  - (3) ensuring that every tractor operator is trained and qualified in all respects to operate the tractor to which the operator is assigned; and
  - (4) selecting tractors designed to perform safely under the most severe conditions of operation and use that may be encountered.

Design and Construction

4. Insofar as is practicable, specifications for tractors should incorporate the following requirements:
  - (1) Operator controls should conform to generally accepted design and safety standards and, when necessary, the function and direction of movement of controls shall be clearly marked.
  - (2) Seats should incorporate a backrest, be adequately sprung or suspended, and adjustable to the operator's height and weight.

- (3) Tractors not provided with a protective cab should be equipped with fenders over the rear wheels which extend beyond the full width of the wheels and are otherwise designed to protect the operator.
- (4) The exhaust from the engine should, where practicable, discharge vertically at least 40 inches (1 m) above the driver, or in such other manner or location whereby the driver is not exposed to the exhaust fumes. If the tractor is provided with a cab, the exhaust should discharge above the roof or in such other manner that exhaust gases are not drawn into the cab.
- (5) Batteries, fuel tanks, oil reservoirs and coolant systems shall, insofar as is practicable, be constructed, located and maintained so that, in the event of upset, spillage will not come in contact with the operator.
- (6) Lighting shall be provided which is sufficient to ensure safe operation under all conditions.
- (7) Tractors operated on public roads and on thoroughfares used by other vehicles shall be equipped with lighting and other safety equipment required by the laws of the province or territory in which the tractor is operated.

#### Guard Devices

5. All auxiliary equipment, implements and drive mechanisms including, where practicable, drive belts, shall be provided with suitable guarding devices.
6. Power take-off mechanisms shall be shrouded and, when not in use, enclosed by a guard of a strength sufficient to withstand potential load factors.

#### Roll-over Protection

7. Where a tractor is likely to turn over under any circumstances of its operation, it shall be fitted with a roll-over protective structure (ROPS) that will prevent the operator from being trapped or crushed under the tractor. ROPS should be designed and installed so as to
  - (1) tend to limit turn-over in any direction to 90°;
  - (2) extend sufficiently to the rear to prevent the operator from coming in contact with attachments in case of a rear tip-over;
  - (3) permit optimum visibility;
  - (4) facilitate the operator's escape in the event of a roll-over;
  - (5) permit convenient attachment and removal of the structure for maintenance repairs; and

- (6) meet, as a minimum, the test procedures and performance requirements set out in USA-OSHA Standards, Part 1928, Sub-part C, 1928.51, 1928.52 and 1928.53, as amended from time to time.
8. Where a ROPS is fitted, a safety seat belt shall be provided and used when the tractor is being operated. Such seat belts shall be anchored in accordance with USA-OSHA Standards, Part 1928, Sub-Part C, 1928.51, and shall meet the requirements of SAE Standard J4C "Motor Vehicle Seat Belt Assemblies".
9. Providing a tractor is not used in a manner and under such conditions that it could turn over, such tractor may be operated without a ROPS under the following circumstances:
  - (1) inside a building or in other areas such as orchards, etc., where, normally, the vertical clearance is insufficient to allow a ROPS-equipped tractor to operate and where the use of the tractor is essential to the work being performed;
  - (2) with accessory equipment which is incompatible with a ROPS (e.g. pickers, harvesters, etc.);
  - (3) where, in the opinion of a Labour Canada safety officer, it is not technically feasible to install a ROPS.

#### Protective "Cabs"

10. Where a protective "cab" is installed on a tractor, it shall be constructed so as to provide
  - (1) the same degree of protection against roll-over as that prescribed for a ROPS;
  - (2) sufficient overhead protection from falling objects, where such hazard may be encountered;
  - (3) some means of emergency egress apart from the normal means of entry and exit; and
  - (4) noise attenuation to the extent that is practicable, in order to reduce dependence on personal hearing protection devices.

#### Noise

11. Tractor operators subject to noise in excess of the levels and/or time-weighting outlined in the Noise Control and Hearing Conservation Standard, TB STD 3-12, shall be provided with approved hearing protectors.

### Protective Clothing

12. Personal protective equipment appropriate to the various hazards encountered shall be worn. This may include hard hats, eye protection, respirators, hearing protectors, reflector-type vests, etc. In this regard, reference should be made to the Personal Protective Equipment Safety Standard, TB STD 3-14.



Introduction

1. The purpose of this procedural guide is to clarify the relationships which should exist between departments and private contractors, where the occupational health or safety of individuals may be adversely affected by activities of private contractors during construction, renovation, maintenance or any other operations, on or in federally owned or leased premises.

Application

2. These Procedures apply to all Public Service departments and agencies, as defined in Part I of Schedule I of the Public Service Staff Relations Act.

Jurisdiction

3. As the work of private contractors and their employees is subject to the laws of the province or territory in which the work is being conducted, the appropriate provincial or territorial authorities have legal jurisdiction over health and safety conditions relative to such work.

Departmental Responsibility

4. If a departmental official becomes aware of a condition or situation, arising out of the activity of a private contractor working on or in federally owned or leased premises, which could pose a hazard to the health or safety of public servants or the general public, that official shall ensure that the appropriate details concerning the hazard are relayed immediately to the manager responsible for the letting and/or control of the contract.
5. The manager responsible for the letting and/or control of the contract, after receiving the details of the dangerous condition, shall
  - (1) make direct arrangements with the contractor to effect the necessary changes to assure the health and safety of those exposed; or
  - (2) where resolution of the situation is not achieved to the satisfaction of the manager or responsible departmental official, advise the appropriate provincial or territorial authority of the matter; or
  - (3) in extreme cases, request the assistance of federal safety officers by contacting the nearest district or regional office of Labour Canada.



CORRECTION OF PHYSICAL SAFETY  
AND HEALTH HAZARDS - PROCEDURES

TB PROC 4-6

Application

1. These Procedures apply to all Public Service departments and agencies, as defined in Part 1 of Schedule 1 of the Public Service Staff Relations Act.

General

2. The prompt correction of physical hazards which could affect the occupational safety or health of Public Service employees is of vital importance because delays might result in occurrences which lead to injury or illness. Whenever hazardous situations are identified through internally-organized departmental programs, or through the services of outside inspection authorities, it is essential that such hazards be rectified with the least possible delay.

Hazard Correction

3. Departments that are responsible for the maintenance of their own property should establish internal procedures to ensure that identified safety or health hazards are given priority attention. If, however, a department must call upon the services of the Department of Public Works to effect hazard correction, the following special procedure is to be used:
  - (1) The request shall be made using Form DPW 337, Tenant Service Request for Estimate or Work (CGS Cat. No. 7540-21-879-7571).
  - (2) In Section 1 of the form, under "Work (Description)", preface the detail with the term "SAFETY/HEALTH HAZARD", and indicate the priority of the request by completing the "Date Work Required" space. If the request is of an urgent nature, the form should be tagged accordingly.
  - (3) In an emergency situation, the work may be requested by telephone, with Form DPW 337 being completed later.
  - (4) If the request is the result of a direction issued by a safety officer under the Canada Labour Code (Part IV), or by an Environmental Health Officer of Health and Welfare Canada, attach a copy of such direction.
4. Requisitions concerning health or safety hazards shall be actioned by the Department of Public Works on a priority basis, and the necessary work will be carried out as soon as is practicable. If the Department of Public Works is unable to meet the required date, the requesting department will be provided with an estimated completion date.

5. Departments and agencies are responsible for ensuring that this special procedure is used only in respect of matters pertaining to employee health and safety, and that all follow-up actions are carried out as required.

## GUIDES



## GUIDES

### Introduction

In addition to the variety of health and safety subjects covered by the preceding Standards and Procedures, there are a number of activity areas within the Public Service of Canada requiring specialized guidelines and information.

The Guides, which are outlined in this section, have been developed to meet this requirement and are designed to assist departments and agencies in the establishment of programs for the prevention of work-related accidents, injuries and illnesses.





SAFETY GUIDE  
FOR  
LABORATORY OPERATIONS  
(2nd Edition)  
TB GUIDE 5-1

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## CHAPTER I

### INTRODUCTION

- 1.1 The operation of laboratories exposes employees to a wide range of occupational risks and hazards. Due to the complex and highly variable nature of these operations, these guidelines provide only a basic outline of the principal safe practices and procedures applicable thereto. All applicable and authorized standards or special instructions should be available for reference by laboratory staff.
- 1.2 Departments and agencies which carry out laboratory work should develop and issue their own detailed safety directives, based on the general requirements of this guide and good industrial safety practices. The directives should indicate, where necessary, when compliance is mandatory for safe operations. Such directives should also include specific references to the use of personal protective equipment in relation to the hazard or exposure encountered.
- 1.3 While all those employed in laboratories have a responsibility to follow safe practices and support the safety program, the principal responsibility and authority for ensuring the safety of laboratory operations rests with the person in charge.
- 1.4 Where chemicals are being used, all materials and procedures should be reviewed regularly for hazards by a professional chemist, biochemist or chemical engineer; changes in materials and procedures should be made to reduce any hazards observed.
- 1.5 Effective communications between all levels of management and between managers and employees is essential for the promotion of safe and healthful working conditions. It is recommended, therefore, that wherever appropriate, safety committees be organized to meet as required to discuss, plan and review the safety of laboratory operations, and where necessary make recommendations to management relative to occupational health and safety.
- 1.6 A program of preventive maintenance of facilities and equipment is also viewed as an important aspect of laboratory safety. In this regard, laboratory personnel should be encouraged to report faulty equipment or procedures and to draw attention to preventive maintenance requirements where applicable.

## CHAPTER 2

### GENERAL LABORATORY DESIGN CRITERIA

#### 2.1 General

This chapter sets out certain information and suggested criteria for the design of safe laboratory facilities, intended to be of assistance to those responsible for laboratory design. The guidelines outlined in this chapter are not intended to cover all facets of laboratory design.

- 2.1.2 Application - It is recommended that these criteria be considered for application or incorporation, where reasonably practicable, into the design of any new or renovated laboratory facilities.
- 2.1.3 Fire Protection - Fire safety rests within the jurisdiction of the office of the Dominion Fire Commissioner, and is covered by Standards issued by that office; hence design aspects related to fire protection or fire safety are excluded from this section except where reference to fire protection standards is required.
- 2.1.4 Interpretation - Persons requiring assistance or advice concerning the interpretation or application of these criteria on laboratory design, should contact the Design Directorate, Department of Public Works, Ottawa.

#### 2.2 General Considerations for Design

- 2.2.1 The design of laboratories, and their furnishings, should aid the implementation of good safety practice yet remain economical. The key to a successful design is a thorough understanding by all design disciplines of the nature and type of work to be conducted in the proposed laboratory.
- 2.2.2 Benching - Continuous tops are needed in wet laboratory areas to prevent the entry of contaminants and liquids between counter units. In dry laboratory areas, joints are acceptable between benching unit tops but these should be secured and tight. Generally, uninterrupted benching should be provided with a cleansweep for housekeeping and without hazard to glassware caused by service outlets.
- 2.2.3 Service Outlets - Deck-mounted services with outlets installed behind the plane of a raised front are recommended. When services themselves could be hazardous due to heat or pressure (steam, compressed gases) the outlet tips should, if possible, be angled down toward the bench top, and should be equipped with reliable and safe shut-off and operating devices. Controls for services should be easily reached without the need for the operator to lean forward over benching or to pass his hand among glassware, equipment, etc. to reach the control.

- 2.2.4 Storage - Corrosive chemicals require to be stored on low shelves or cupboards for safety; chemicals of hazardous combination require separate storage. Extremely strong oxidizers (e.g. perchlorates) or potentially unstable compounds require individual and separate storage.
- 2.2.5 Floor Strength - Since occupancy and use can change quite frequently, introducing appreciable change in floor loading requirements, care should be taken to ensure that the building design is adequate with respect to loading, and that the building structure remains safe after other, changed, operations begin. Final drawings should show permissible floor loads, which should be carefully observed.
- 2.2.6 Pressure Vessels - Designs and installations should be in accordance with related standards. All fittings should meet requirements of the inspecting authority.
- 2.2.7 Environmental Standards - Spaces for employee occupancy in laboratories should be maintained at the comfort level as established. Spaces requiring special functional or operational conditions - temperature, humidity, air purity or other - should be served by separate environmental engineering systems.
- 2.2.7.1 Fume Hoods - Contamination from laboratory work and chemical testing procedures should not be permitted to reach the breathing zones of laboratory personnel. This can be achieved by restricting the contaminant-producing procedures to an enclosure or hood which is exhausted to the outside. A laboratory fume hood is a ventilated enclosed work space consisting of side, back and top enclosure panels, a work surface or deck, a work opening called the face, and an exhaust plenum equipped with horizontal adjustable slots for the regulation of air flow distribution. The work opening may be unrestricted or may be equipped with operable glass doors for observation and shielding purposes. In the design of a fume hood and its exhaust system the following factors should be considered:
- (a) effective capture velocities to remove contaminants;
  - (b) a balanced air supply;
  - (c) even air distribution;
  - (d) safe construction materials for hood, ducts and fans;

- (e) hood location - away from corridors or doors;
- (f) fan location - for negative pressure in whole exhaust system;
- (g) face velocity control - adjustable air slots, baffles and by-pass systems;
- (h) exhaust dispersal to atmosphere and/or exhaust air treatment;
- (i) size of hood - as small as possible for maximum safety;
- (j) specific hazards of laboratory operations, such as potentially explosive accumulations from perchloric acid, or spread of infectious aerosols.

- 2.2.7.2 Fume hoods are required for work that generates dusts, fumes, gases and vapours that must not be released into the laboratory environment. These contaminants may be toxic, corrosive, flammable or unpleasant. Certain highly toxic materials must be worked only in total enclosures, e.g. plutonium and certain carcinogens.
- 2.2.7.3 Since it is impossible to provide one type of hood for all possible uses it is imperative that laboratory managers and laboratory supervisors ensure that hoods are restricted to the uses for which they have been designed. A general purpose fume hood for use in chemical and associated laboratories must be capable of being used for a broad spectrum of materials, and during its expected working life both the materials used in it and the staff associated with it are likely to change. It is therefore important that any limits imposed on the hood use be clearly posted and maintained.
- 2.2.7.4 Thermal convection currents within the hood or mechanical agitation and aspirating action by cross currents of air outside the hood can adversely affect safe operation and allow contaminants to enter the working zone. Hoods should therefore be kept free of unnecessary apparatus and be operated with the sash at the smallest possible opening. When the hood is not in use, the sash should be closed for maximum safety.

2.2.7.5 The required air velocity at the hood face will vary, depending on the chemicals and test materials being used. Normally, to prevent or limit the escape of contaminants or discomforting fumes, an average velocity of from 100 to 150 ft/min (0.5 m/s to 0.76 m/s) will be required. Because air velocities of this nature require extensive air make-up and exhaust systems, the required velocities may in certain instances only be obtainable with the sash in the normal working position, or at a sash opening of not less than 12 inches (0.30 m). Nevertheless, where the work involves chemicals or materials of significant toxicity, the required air velocities should be obtainable with the sash fully open.

- 2.2.7.6 The degree of hazard present during fume hood operation is influenced by factors such as
- (a) the proximity of breathing zones to the contaminant emission point;
  - (b) the frequency and duration of contaminant emission;
  - (c) the inherent air current disturbances;
  - (d) the direct handling and process manipulations required;
  - (e) the operator attendance time;
  - (f) the quantity of contaminants released to air; and
  - (g) the potential health effects of any airborne contaminants.

Advice on the degree of hazard associated with specific contaminants may be obtained from the various Regional Medical Services Offices of Health and Welfare Canada.

- 2.2.7.7 Guidelines for air velocity at the hood face are provided in Table I, illustrating the recommended average face velocities for various degrees of hazard. The maximum sash openings at which the face velocities must be obtainable take into account the safety of persons using the hoods, the conduct of the work, and the problems encountered in providing the required face velocities. When a sash opening of less than full face height is used to establish face velocity,

a positive stop should be installed to prevent inadvertent use of the hood with a larger sash opening. The stop may be designed with an override to permit full opening of the sash when required for the insertion and removal of test equipment and materials, maintenance and cleaning of the hood, etc. A permanent and clearly worded decal should be displayed prominently, to define the safe operating parameters.

- 2.2.7.8 Hood Construction - Fume hoods should be constructed of suitable fire- and corrosion-resistant materials and with glazing components appropriate to the hazard involved.
- 2.2.7.9 Hood Services and Controls - Piped services with outlets inside a fume hood should be remotely controlled from accessible locations outside the hood enclosure. Fittings and installations should meet all applicable codes. Switches, rheostats and other control devices for electrical apparatus to be used within hoods should be located on the outside of the apparatus enclosure. Explosion-proof electrical components external on hoods, or in hoods, are required only when the area environment is an explosive hazard.
- 2.2.7.10 Electrical - The hood ventilating fan motor and all wiring and equipment should bear the approval label of, and be installed in accordance with, the Canadian Electrical Code CSA 22.1. Electrical equipment should be of a type suitable to the hazards of the location as defined in the Canadian Electrical Code, Section 18. Grounding strips should be provided across electrical interruptions in metallic ductwork.



TABLE I  
GUIDELINES: VELOCITY AT HOOD FACE

	<u>Degree of Hazard</u>	<u>Average Velocity At Hood Face</u>	<u>Sash Opening</u>
(a)	Low level radioactive tracer materials and chemicals with nominal toxicity hazards	100 fpm (0.5 m/s)	12" (0.30 m)
(b)	Moderately hazardous air contaminants with a higher risk of personal exposure	150 fpm (0.76 m/s)	12" (0.30 m)
(c)	Perchloric acid hoods	150 fpm (0.76 m/s)	12" (0.30 m)
(d)	Highly radioactive materials or hazardous chemicals	150 fpm (0.76 m/s)	Full open

- Notes:
1. Variations in air velocity across the working face should not exceed  $\pm 25$  per cent, and periodic tests should be made to ensure that hoods continue to meet the desired specifications.
  2. Glove boxes or total enclosures should be used whenever practicable, when velocities of 150 fpm (0.76 m/s) or above are required.

2.2.7.11 Exhaust Fan - The fan blades should be of a non-corrosive, non-sparking metal. If the fan is belt-driven, the belt should be a conductive type to prevent the accumulation of static electricity. The fan should be located near the fume exhaust duct outlet to eliminate the possibility of fume leakage from a pressurized section of duct. Exhaust ducts should be located with due regard to any air intakes and designed so that exhaust is effectively dispersed.

2.2.7.12 Hoods for use with perchloric acid should be constructed of acid-resistant material, be liquid tight, with vertical and separate exhaust ducts, and with spray wash-down of both hood and duct. A roof-mounted venturi fan is recommended.

### 2.3 Laboratory Design Codes, Standards and References

- 2.3.1 General Requirements - The following should be followed in the design and construction of laboratories:

- National Building Code of Canada;
  - Fire Protection Engineering Standards - and other fire prevention or protection directives issued by the Dominion Fire Commissioner;
  - All applicable codes issued by the Radiation Protection Bureau of Health and Welfare Canada;
  - Care of Experimental Animals - A Guide for Canada, issued by the Canadian Council of Animal Care;
  - Hazardous Substances Code - issued by the National Fire Protection Association, the Chlorine Institute Inc.;
  - All Health and Safety Standards approved by the Treasury Board for application in the Public Service of Canada.
- 2.3.2 Boilers and Pressure Vessels - Boilers and pressure vessels used in connection with building systems should comply in all respects with the standard respecting the safe operation of Boilers and Pressure Vessels, Public Service of Canada.
- 2.3.3 Illumination - To the extent that is reasonably practicable, lighting systems should comply with Canadian Standards Association Industrial Lighting Standard 92-1-1967, as amended from time to time. In any event, minimum recommended levels of illumination on the task should be as shown in the following chart:

TABLE II  
MINIMUM RECOMMENDED LEVELS OF ILLUMINATION

<u>Area/Operation</u>	<u>Footcandles</u>	(lux)
Reading instruments, gauges, etc., where errors could be the cause of a hazardous condition	80	(850)
Working with hazardous substances of severe or moderate hazard	70	(750)
General laboratory work of low hazard		
Medium or fine work	60	(650)
Rough work	30	(300)
Emergency shower locations	5	(50)
Emergency lighting	3	(30)

- 2.3.4 Floors - Floor coverings or finishes should resist liquid penetration, be easy to clean and resistant to slipping.
- 2.3.5 Doors - Doors should be sufficient in both number and size and so located as to allow quick emergency evacuation. Conspicuous markings on glass doors or panels, and vision panels on free-swinging solid doors, may eliminate certain traffic hazards.
- 2.3.6 Ladders and Floor and Wall Openings
- 2.3.6.1 Ladder installations should comply with American National Standards Institute A-14.3 Safety Code for Fixed Ladders, as amended from time to time.
- 2.3.6.2 Floor and wall openings and holes, as defined in the standard cited below, should be guarded as recommended by the American National Standards Institute in its Standard "Safety Requirements for Floor and Wall Openings, Railings and Toe-Boards" A-12.1, as amended from time to time.
- 2.3.7 Utilities
- 2.3.7.1 All piping systems should be clearly marked and available to inspection, with identification in accordance with CSA standard B53 "Code for identification of Piping Systems".
- 2.3.7.2 Potable water systems should not be endangered by laboratory work. Great care is necessary to ensure that flexible or other temporary connections to potable systems do not prevent the proper function of protective devices such as vacuum breakers and backflow preventers in the permanent system.
- 2.3.7.3 Central vacuum systems should not be connected to zones which are potential sources of contamination and from which the system could spread the hazard. Radio-isotope and microbiology areas are such zones; vacuum requirements in these areas should be created by a separate vacuum pump in each room requiring the service.
- 2.3.7.4 All electrical installations and facilities in a laboratory or workplace should comply with the recommendations of the Canadian Standards Association standard C22.1 and amendments thereto, and be approved for use in accordance with that standard, for the classification of the hazard in the work place.

2.3.7.5 Standby electrical power should be available for use in the event of a commercial power failure and should have capacity to supply at least emergency lighting plus any hazardous facilities such as ventilated animal cages, some incinerators and refrigerators, etc.

2.3.8 Emergency Equipment - Equipment as indicated hereunder should be provided to deal with emergency situations involving hazardous materials:

- (a) Emergency shower and/or eye wash equipment should be provided wherever there is a significant exposure to hazardous materials and a risk of skin or eye injury due to accidental splashes of such materials. The temperature of any connected water supply should not exceed 100°F (38°C).
- (b) Emergency power facilities should be provided wherever, in hazardous areas, a failure of power supply would cause dangerous conditions.

2.3.9 Radiation-emitting Equipment - The design, construction, functioning, installation, maintenance, operation and use of x-ray, laser, microwave, ultrasound and ultraviolet radiation-emitting equipment must comply with recommendations, safety codes and regulations issued by the Radiation Protection Bureau of the Department of National Health and Welfare (see Chapter 4).

2.3.10 Laboratory Furniture

2.3.10.1 All laboratory benches, tables, and cupboards should be secure against upset. Stools, if not fixed, should be solid and stable and adequate knee-space should be provided.

2.3.10.2 Bench widths should be such that utility controls located at the back can be reached safely. Gangways between benches should be wide enough to permit safe movement in normal working conditions and quick escape in an emergency.

2.3.10.3 Laboratory furnishings should be constructed of materials to suit the functional needs of the laboratory.

2.3.11 Equipment Safeguards - To the extent that it is reasonably practicable, all machines purchased for laboratory use should be so designed and constructed as to be safe. If an apparatus is a significant work hazard it should be fitted with a guard that will effectively prevent injury to any person.

- 2.3.12 Protective Shields - Suitable shields and barricades should be provided to protect laboratory personnel from the hazards of explosion, rupture of apparatus and systems from over-pressure, implosion due to vacuum, sprays or emissions of toxic or corrosive materials, or flash ignition of escaping vapours.
- 2.3.13 Safety Containers
- 2.3.13.1 Designs of chemical laboratories should incorporate provision of functional space and facilities for temporary storage and use of appropriate safety containers to facilitate safe disposal of waste liquids or materials for which discharge to a building drain is not acceptable (e.g. solvents, radioactive materials).
- 2.3.14 Static Grounding - Static bonding and grounding should be provided wherever flammable liquids are dispensed from containers of over 5-gallon (22.5 litre) capacity.
- 2.3.15 Warning Signs
- 2.3.15.1 Particular systems and facilities designed into a laboratory may require warning signs, or colour symbols, to represent hazard (e.g. chemical stores, radioactive and microbial filtration, perchloric exhaust components in penthouses and on a roof).
- 2.3.15.2 The design of any warning sign should stipulate the location and angle of disposition of the sign for clearest display, and call for such signs to be painted according to the established colour coding.
- 2.3.16 Biological Considerations for Design
- 2.3.16.1 Laboratory buildings for handling micro-organisms pathogenic for humans should be zoned into areas designated as (a) clean and (b) contaminated, separated by an air lock with an ultra-violet (UV) door barrier and ceiling-mounted UV lights.
- 2.3.16.2 Separate clean and contaminated change rooms, with an air lock between them, should be provided to serve as transitional areas through which personnel enter and leave the potentially infectious parts of the building. Shower facilities, or space for their future installation, and lockers for street clothing should be provided. The contaminated change room should contain a UV discard clothing rack and ventilated storage for laboratory shoes. Effluents from contaminated areas may require treatment.

- 2.3.16.3 The air pressure of the whole contaminated zone should be continuously negative in relation to the clean zone. Within the contaminated zone, the air pressure balance of rooms where infectious materials are handled should be further negative to corridors. Air from the contaminated zone should not be recirculated.
- 2.3.16.4 The water taps of sinks in the contaminated zone should be knee or blade activated. Lighting fixtures, pipes, conduits and other services should be designed and installed using seals where appropriate to preserve the biological separation between contaminated and clean zones.
- 2.3.16.5 Paints, coating and other finishes on floors, walls, ceilings and other surfaces should be resistant to wash-down or steam decontamination. Materials and equipment should be conducive to decontamination.
- 2.3.16.6 In designing the laboratory, consideration should be given to the full and proper use of ventilated microbiological cabinets, available in two basic types:
- partial barrier cabinets (including laminar flow units)
  - absolute barrier cabinets.

The type selected for use should be decided upon after an assessment of the risk of the operation and the degree of hazard.

The minimum air flow across the opening of partial barrier cabinets should be 100 linear feet per minute (0.5 m/s). Absolute barrier cabinets are of gas-tight construction and operate at a constant negative air pressure; air exhausted from these cabinets and from other apparatus where microbial aerosols are involved should be filtered. Air filters should be installed in a manner permitting their decontamination in situ, or replacement, without hazard to employees.

## 2.3.17 Design of Animal Facilities

- 2.3.17.1 The laboratory animal area typically includes rooms for inoculation and autopsy, as well as rooms for holding infected animals. In all cases, safe working conditions for personnel

should be provided to prevent any potential hazard possible from undesired animal cross-infection. Where a high degree of isolation is required, individually ventilated cages should be provided to hold infected animals. In some instances, animals may be housed in cages under a UV light barrier. Non-portable ventilated animal compartments (Horsfall units) are recommended for housing animals exposed to or infected with highly infectious micro-organisms.

- 2.3.17.2 A large autoclave or steamer should be provided for sterilizing cages and racks and for passing these through to a washing room.
- 2.3.17.3 The heavier-than-air ammonia should be removed, if possible, by introducing ventilating supply air near the ceiling and exhausting near the floor.

#### 2.3.18 Laboratory Support Areas (Biological)

- 2.3.18.1 The laboratory support area should be located outside the contaminated zone. This includes rooms for holding healthy animals; for washings, final sterilizing and storing glassware and animal cages; and for preparing media and repairing laboratory equipment. Because many of the procedures are heat-generating and odour-producing, the ventilation system should be designed with care.
- 2.3.18.2 A waste collection treatment unit for treating liquid or solid wastes may be necessary in certain applications.

## 2.4 References

"Handbook of Laboratory Safety",  
The Chemical Rubber Company,  
18901 Cranwood Parkway,  
Cleveland, Ohio. 44128

"Microbial Contamination Control Facilities",  
Van Nostrand Reinhold Publishing Company,  
1410 Birchmount Road,  
Scarborough, Ontario.

"Accident Prevention Manual for  
Industrial Operations",  
National Safety Council,  
425 North Michigan Avenue,  
Chicago, Illinois. 60611

"Industrial Ventilation Manual",  
American Conference of Governmental  
and Industrial Hygienists,  
1014 East Broadway,  
Cincinnati, Ohio. 45202

"Threshold Limit Values",  
1969 and Amendments,  
American Conference of  
Governmental and  
Industrial Hygienists.

"Industrial Hygiene Practices Guide  
for Laboratory Hood Ventilation",  
American Conference of Governmental  
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"The Tuberculosis Diagnostic Laboratory",  
Canadian Journal of Public Health,  
Canadian Public Health Association,  
125 Young Street,  
Toronto 7, Ontario.

"Chemical Safety Data Sheets",  
Manufacturing Chemists Association,  
1825 Connecticut Avenue, N.W.,  
Washington, D.C. 20009

Dominion Fire Commissioner,  
Technical Information Bulletins.



## CHAPTER 3

### GENERAL SAFETY PRACTICES

This chapter sets out general safety practices for several areas of principal concern. It does not attempt to list all of the precautions and safety measures which may be required. More detailed information concerning these and other specific procedures and guidelines may be obtained from the appropriate references listed in this chapter.

#### 3.1 Cryogenics

##### 3.1.1 General

- 3.1.1.1 A cryogen is any refrigerant used to obtain a temperature lower than  $-58^{\circ}\text{F}$  ( $-50^{\circ}\text{C}$ ). Potential hazards occur because cryogenic fluids are extremely cold, and in some processes very small amounts of liquids are converted into large volumes of gas. Liquids which boil at very low temperatures will condense oxygen from the air, which in turn creates an explosion or combustion hazard.
- 3.1.1.2 The user of cryogenic fluids should have a thorough knowledge of the characteristics of the gas at temperatures and pressures being used, and the appropriate safety precautions for the handling of the individual liquid. Particularly, users should know how to recognize and eliminate leaks, and what to do in the event of an explosion or implosion.
- 3.1.1.3 Only authorized and qualified personnel should have access to the storage area for cryogenic fluids. Gaseous or liquid oxygen should be kept in its own particular area, without any other gases being allowed except gaseous nitrogen and gaseous carbon dioxide. Liquid nitrogen should not be stored with helium, hydrogen or oxygen. Walls and floors of such storage areas should be concrete or reinforced concrete.

- 3.1.2 Hazards - Danger of fire and explosion exists with escaping cryogens such as oxygen and hydrogen. The danger is such that even materials normally non-combustible will ignite if allowed to become coated with an oxygen-rich condensate. Thermal shock to containers, or a gas pressure greater than the containers are designed to hold, may cause explosions. Implosions may result from pressures produced by cryo-pumping which are nearly equal to the existing atmospheric pressure on the equipment being used, unless this equipment is designed to withstand such pressure changes.

Structural or other material coming into contact with cryogenic fluids may become combustible, explosive, or subject to failure from strain or impact due to altered physical characteristics. Direct or indirect uninsulated contact with cryogenic fluids causes cold burns (frostbite); delicate surfaces, such as eyes, can be damaged by a brief exposure. With the exception of oxygen, rapid expansion of cryogenic fluids results in an oxygen-deficient atmosphere if the immediate environment is inadequately ventilated; this can lead to asphyxiation.

### 3.1.3 Special Safety Precautions

- 3.1.3.1 Warning signs should be posted where cryogenics are stored or being used, and the name of the cryogenics should be shown.
- 3.1.3.2 Proper ventilation where cryogenics are stored or being used is required, to reduce the danger of explosion, fire or asphyxiation.
- 3.1.3.3 Vessels containing cryogenics should be thermally isolated from sources of heat. When not in use, containers used for the transport of cryogenic fluids should be secured with chains or straps to a substantial support, such as a wall or a fixed bench, to protect against upsets.
- 3.1.3.4 All vessels containing cryogenics should be provided with a vent or other approved safety device which permits the escape of excess pressure and vapours.
- 3.1.3.5 Containers should be filled only with the liquids that they were designed to hold. Each container should be labelled as to which cryogenic fluid it contains.
- 3.1.3.6 When pouring a liquid cryogen into a Dewar Flask or other container, a metal funnel should be used, and a face shield and insulated gloves should be worn.
- 3.1.3.7 Personnel should always stand clear of boiling or splashing cryogen, and perform operations slowly to minimize any boiling or splashing.
- 3.1.3.8 Vessels designed and constructed as containers for cryogenics should not be welded or heated while the vessel contains a cryogen.
- 3.1.3.9 Liquid nitrogen heavily contaminated with oxygen should be handled with precautions applicable to

liquid oxygen. The appearance of a blue tint in liquid nitrogen is a direct indication of oxygen contamination.

#### 3.1.4 Personal Protection

- 3.1.4.1 Eyes and face should be protected with a face shield whenever there is a danger of injury from physical or chemical agents.
- 3.1.4.2 Gloves should be worn when handling anything that is or may have been in contact with a cryogenic liquid. Asbestos gloves are preferable, but leather gloves may be used. The gloves should fit loosely, so that they can be removed quickly (thrown off) if liquid spills or splashes into them.
- 3.1.4.3 A knee-length laboratory coat with cuffless long sleeves, or a full-length apron of non-porous material which fastens at the back, should be worn. Coats and aprons should have neither pockets nor cuffs.
- 3.1.4.4 Boots with tops sufficiently high to be covered by the trouser leg (which should be cuffless) should be worn.
- 3.1.4.5 An appropriate eye wash fountain or eye wash bottle and safety shower should be available.
- 3.1.4.6 Watches, rings, bracelets or other jewellery should not be worn by personnel handling cryogenics.

#### 3.1.5 Cold Traps

- 3.1.5.1 Cold traps improperly employed can impair accuracy, destroy instrumentation and systems, and be a physical hazard. In addition, the slush mixtures frequently used in cold traps should be handled with care, because many are toxic and present explosive hazards that are not necessarily referred to in the literature.
- 3.1.5.2 Operations should always be performed slowly, to minimize boiling and splashing, when charging a warm condenser or inserting objects into a cryogenic liquid.
- 3.1.5.3 If liquid nitrogen is the coolant, the trap should be charged only after the system is pumped down. This is because liquid air containing oxygen can condense in the trap, and a considerable amount of the liquid oxygen in it may also condense, creating a major hazard.

3.1.5.4 The trap should be suitably vented or exhausted, if the cooling bath is removed, so that any condensate which will then evaporate from the trap will not pressurize the system.

### 3.1.6 References

"Handbook of Laboratory Safety",  
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Cleveland, Ohio, 44128

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National Safety News,  
Data Sheet D-472, December 1958,  
National Safety Council,  
North Michigan Avenue,  
Chicago, Illinois. 60611

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1410 Birchmount Road,  
Scarborough, Ontario.

"Personal Protective Equipment  
Safety Standard", (TB STD 3-14),  
Public Service of Canada.

## 3.2 Compressed Gas

- 3.2.1 General - A gas having a pressure in the container in excess of 40 psia (280 kPa) at room temperature, and a flammable liquid having a Reid vapour pressure exceeding 40 psia (280 kPa) at 100°F (38°C), are classified as compressed gases. They must be handled with care in all phases: storage, transportation, connection, use and disposal. All personnel who handle, manipulate or work in the presence of compressed gases should be made aware of the dangers of exploding cylinders, and the projectile-like behaviour of a cylinder under circumstances of a sudden pressure release. All personnel should be made aware of the physical, chemical and toxic properties of any gas used in the laboratory operation. Contracts and purchase orders should show the required CGA connection number for the cylinder to be supplied.
- 3.2.2 Cylinder Contents - Each cylinder should be logged in and out of the laboratory operation, recording the serial number stamped on the cylinder and the contents as received. Under no circumstances should attempts be made to alter the chemical composition of the cylinder contents by introduction of impurities. If the contents of a cylinder are not definitely known, the cylinder should be clearly labelled "contents unknown" and the supplier notified for disposal. Coding of cylinders varies among suppliers. Depending on the grade of the product contents, some suppliers choose to code by purity rather than chemical content. Colour codes may not be reliable indicators of cylinder contents.
- 3.2.3 Properties of Contents - Each person should be aware of the chemical, physical and physiological properties of gases used. Charts, listing characteristics of each gas and toxic thresholds, should be posted in a prominent location for reference and emergency situations. All toxic gases should be either used in, or vented into, a fume hood. All fume hoods so used should be marked accordingly, specifying the hazard. Cylinders should not be exposed to temperatures in excess of 120°F (50°C). Cylinders containing flammable or oxidizing gases should be used in locations having good ventilation.
- 3.2.4 Cylinder Handling - Misuse, abuse or mishandling of compressed gas cylinders may result in serious accidents. Observance of the following will help reduce the hazards:
- 3.2.4.1 Cylinders should be protected from cuts or abrasions and not allowed to drop or strike each other violently.

- 3.2.4.2 Cylinders weighing in excess of 40 lbs (18 kg) (total) should be transported by cart, properly retained in a vertical position.
- 3.2.4.3 Cylinders may be rolled on the bottom edge for short distances but should not be dragged.
- 3.2.4.4 Cylinders should not be transported without the valve protection cap securely in place.
- 3.2.4.5 Always assume cylinders to be full and handle them accordingly.
- 3.2.4.6 Oil and grease should never be permitted to come in contact with oxygen cylinder valves, regulators, hoses or associated equipment, nor should combustible substances be used as lubricants. The operator should ensure that there is no oil or grease on his hands, gloves or clothing.

### 3.2.5 Cylinder Storage

- 3.2.5.1 Cylinders should be stored in a secure, dry, well-ventilated area, clear of exit routes and fire exits, heat or ignition sources, and with valve protection caps securely in place.
- 3.2.5.2 Segregated areas should be defined according to cylinder content: flammable, oxidizing and inert.
- 3.2.5.3 Indoor storage areas for oxidizing gases should be separated from flammable gases and highly combustible materials by at least 20 feet (6.0 m), and by an approved fire-resistant partition.
- 3.2.5.4 Indoor ventilation should be provided at both floor and ceiling levels and conform to fire regulations.
- 3.2.5.5 Cylinders containing gases such as acetylene, liquified propane and liquified carbon dioxide should be stored upright.
- 3.2.5.6 Storage areas should be fitted with cylinder racks securely anchored to the wall at a height appropriate for the cylinder to be stored.
- 3.2.5.7 Cylinders should be individually secured to the storage rack, not more than two rows deep, using chains, straps or bars.

3.2.5.8 Full and empty cylinders should be stored separately, with the latter clearly identified as such.

3.2.6 Leaks - Leaking cylinders are hazardous and wasteful.

3.2.6.1 A contingency plan for leaking cylinders should be defined and known to all laboratory personnel in areas where compressed gases are used.

3.2.6.2 Where available, the faulty cylinder should be placed in a walk-in fume hood, the fume hood identified, and the supplier notified. Alternatively, the cylinder should be moved out of doors to a secure area to await disposal by supplier.

3.2.6.3 Some stem valves used on cylinders for low molecular weight gases such as hydrogen will leak when fully opened. Under no circumstances should any adjustment to the stem packing nut or pressure relief safety nut be even considered. Such actions are extremely hazardous, and are the responsibility of the supplier alone.

3.2.6.4 Leaks resulting from improper plumbing or worn fittings should be identified, using approved liquids or detection instrumentation. If wear is the reason for the problem, the components should be replaced.

3.2.6.5 Fittings should not be tightened beyond the manufacturer's specifications.

3.2.7 Regulators - Each person expected to use compressed gases should be instructed on the proper installation and use of regulators.

3.2.7.1 Cylinders of compressed gas should only be connected to regulators specified for use with the contents of the cylinder. C.G.A. regulations should be adhered to at all times.

3.2.7.2 The seat of the cylinder stem valve should be cleaned before coupling with the regulator. The stem valve should not be used to blow out the regulator fitting seat.

3.2.7.3 The regulator should be closed before coupling. Do not over-tighten the coupling nut from the regulator stem.

- 3.2.7.4 Once the regulator is installed, and before use or further connection to apparatus, the regulator-to-cylinder connections should be checked for leaks.
- 3.2.7.5 In addition to the use of liquid and detection instruments, the regulator can be used to detect leaks. Open the cylinder stem valve and note the pressure. Close the stem valve and wait 15 minutes. There will have been no pressure drop if the regulator/cylinder connection is leak-free.
- 3.2.7.6 A similar procedure can be applied to other portions of the gas plumbing to verify the integrity of the system. Should a leak be detected, close the cylinder stem valve.

Breathing Apparatus - Laboratories handling toxic gases must have appropriate personal protective equipment on hand in case of leaks or accidents. Self-contained breathing apparatus is preferred, but respirators with suitable fresh canisters may be acceptable, bearing in mind the nature of the gas and the possible concentrations.

### 3.2.8 References

"Handbook of Laboratory Safety",  
The Chemical Rubber Company,  
18901 Cranwood Parkway,  
Cleveland, Ohio. 44128

"Handbook of Compressed Gases",  
Compressed Gas Association Inc.,  
Van Nostrand Reinhold Publishing  
Company,  
1410 Birchmount Road,  
Scarborough, Ontario.

"The Use and Handling of Compressed  
Gases",  
Bulletin 259, revised 1969,  
U.S. Department of Labour,  
U.S. Government Printing Office,  
Washington, D.C. 20402.

"Production, Storage and Handling  
of Liquid Natural Gas", (2-276),  
Canadian Standards Association,  
77 Spencer Street,  
Ottawa, Ontario.

"Matheson Gas Data Book",  
Matheson of Canada Limited,  
Whitby, Ontario.



### 3.3 Glass

- 3.3.1 General - Standard safe practices, including the wearing of eye and face protection, are necessary in the handling and use of glass to prevent injuries or illnesses from explosions, ruptures from overpressure, implosion due to vacuum, spills, sprays or emission of toxic or corrosive materials, or flash ignition of escaping vapours.
- 3.3.2 Disposal - Broken or cracked glass should not be placed in waste bins designed to receive paper and other laboratory waste. A separate metal container, appropriately labelled, should be available for such use in each laboratory.
- 3.3.3 Storage Glass and glassware should be stored on shelves no higher than a person of average height can reach from floor level. Delicate pieces should be protected by storing in cartons clearly marked for easy identification. No item of glassware should protrude over the edge of shelving.
- 3.3.4 Selection of Glassware - When selecting a piece of glassware for use, care should be taken to ensure that it is designed for the type of work planned. For pressures even slightly above normal, pressure bottles should be specifically chosen, and vacuum flasks should be used for filtration with the aid of suction. Types of glass rods and tubing can be identified by refraction and comparison with approved standards. Where caustics are used, glass-to-teflon connections and stoppers (or suitable alternatives) may reduce hazards, especially in the reduction of seized joinings.
- 3.3.5 Setting up Apparatus - Apparatus (a combination of two or more units) should be set up with units adequately supported by clamps on stands. Laminated safety-glass protective shields should be placed around the apparatus to protect workers on both sides of the bench, if necessary.
- 3.3.6 Cutting Tubing and Rods - The ends of any glass piece cut in the laboratory should be squared and fire-polished prior to its employment. Protective hand covering should be used when working with glass rods and tubing.
- 3.3.7 Glass and Rubber or Cork Connections - The correct bore should be selected, so that the insertion can be made without undue force. The glass and stopper should be wet (water or glycerine). Appropriate hand and eye protection should be used. Extreme care should be exercised when removing a glass rod or tube that is stuck to a rubber stopper.

- 3.3.8 Heating of Glassware - Care should be taken to ensure that the type of glass to be used will withstand the heat to be applied. The heat source, and the method of heating to be used, should be selected carefully in relation to the liquid or material to be heated.
- 3.3.9 Glassware under Pressure or Vacuum - Heated pressure vessels should be shielded in case an accident occurs. Pressure should not be applied internally to a liquid in glassware to expel the contents. Personnel should be protected against implosion of evacuated glassware, using guards of wire screen or perforated metal.
- 3.3.10 Seized Glass-to-Glass Surfaces - During attempts to separate, extreme care and patience should be exercised and hands must be protected. Glass-to-teflon or other suitable alternatives may reduce hazards when caustics are used, as noted in 3.3.4.
- 3.3.11 Cleaning Glassware - Before cleaning glassware the user should ensure that each piece is free of any material that might present a hazard. The use of mild cleaners is preferred to strong acids or caustics. Should the latter be used, the glassware should be well rinsed and dried afterwards. Hand and eye protection should be stressed, and procedures devised which will reduce the hazards from possible breakage.
- 3.3.12 Transporting Glassware - To reduce the hazards from breakage during transport, special chemical-resistant metal or plastic containers of adequate size should be used to transport all bottles containing acids, alkalines, or other corrosive or flammable liquids. Desiccants under vacuum may be transported in a wooden box or metal shield; in such instances appropriate carrying tongs should be used when handling beakers and other glassware.
- 3.3.13 Labelling Bottles - All reagent bottles and other containers of laboratory chemicals should be clearly labelled and dated. A coat of clear lacquer applied to the label will protect it.
- 3.3.14 Ullage in Bottles - Bottles should be filled to not more than three-fourths of their capacity at room temperature.
- 3.3.15 Special Hazards - The handling of hazardous products in glass containers should be controlled by local laboratory directives.
- 3.3.16 References

"Guide for Safety in the Chemical Laboratory",  
Manufacturing Chemists Association,  
1825 Connecticut Avenue, N.W.,  
Washington, D.C. 20009

"Laboratory Glassware",  
Safety Education Data Sheet No. 23,  
National Safety Council,  
425 North Michigan Avenue,  
Chicago, Illinois. 60611

"Bottles and Broken Glass",  
Safety Education Data Sheet No. 355,  
National Safety Council.

"Safety Measures in Chemical  
Laboratories",  
Third Edition - 1964,  
National Chemical Laboratory,  
Teddington, Middlesex, England.

"Handbook of Laboratory Safety",  
The Chemical Rubber Company,  
18901 Cranwood Parkway,  
Cleveland, Ohio. 44128

"Dangerous Substances Safety  
Standard",  
(TB STD 3-2), Public Service of  
Canada.

"Personal Protective Equipment Safety  
Standard", (TB STD 3-14),  
Public Service of Canada.

### 3.4 Instruments and Other Equipment

- 3.4.1 General - All instruments, and associated electrical equipment, should be inspected periodically for defects and replaced as necessary. The following review of the more common equipment will aid in determining which safety items to check on various types of equipment. Where good industrial laboratory practice prescribes it, personal protective equipment including hand, eye and face protection should be worn, as is appropriate to the hazard associated with the use of the various types of equipment.
- 3.4.2 Autoclaves - All autoclaves should be provided with interlocks to prevent the opening of the charging door until all pressure has been relieved. High-pressure types should have integral explosion protection and control for safe operation.
- 3.4.3 Calorimeter Bombs - Adequate shielding as a protection against explosion should be used.

- 3.4.4 Centrifuges - Centrifuges should be of double-walled construction to prevent fly-aways, and equipped with a disconnect switch on the lid. The centrifuge should be located where vibration will not cause items to fall off nearby shelves. Exhaust ventilation should be provided, especially if flammables are to be centrifuged.
- 3.4.5 Chromatography Equipment - Insulation for radiation, and for ventilation to contain and remove hazardous vapour, should be provided.
- 3.4.6 Distillation Apparatus - Fail-safe devices should be used to guard against possible fluctuations or failure in water pressure and electrical power.
- 3.4.7 Fraction Collectors - Fraction collectors should be isolated from sources of ignition. Adequate ventilation is necessary and construction should be explosion-proof.
- 3.4.8 Microtomes - A lock to prevent inadvertent operation, and a guard to protect the operator against the cutters, should be provided.
- 3.4.9 Paraffin Dispensers and Vacuum Infiltrators - An automatic over-temperature shut-off should be in series with the thermostatic control.
- 3.4.10 Ovens - Ovens used in service with explosive materials should be equipped with blow-out panels or magnetic latches which open at pressures slightly above one atmosphere. Forced draft ventilation, inert gas purging, exhaust ventilation or other appropriate means should be used, to prevent a build-up of explosive concentrations of vapour in ovens. Reliable, well-maintained and accurately calibrated thermostatic controls, with units clearly marked, should be used to prevent excessive heating. All controls should be designed to fail safe. Where an oven is supported by a table or counter, the counter or table top should be constructed of non-combustible material, or adequate ventilation should be provided between the supporting surface and the bottom of the oven.
- 3.4.11 Electrical and Electronic Instruments and Equipment - These should be inspected periodically for hazardous leakage currents, and repaired or replaced as necessary. The use of ground-fault circuit interruptors should be considered where electrical/electronic equipment is used in locations which increase the possibility of shock hazard.
- 3.4.12 Mercury Vapour - Mercury diffusion pumps, and any other equipment that produces mercury vapour, should be provided with exhaust ventilation.

### 3.5 Storage of Chemicals

- 3.5.1 General - Due to the wide range of chemicals and materials used in laboratories, good storage practice and reliable current inventory control is important. Neglect of the physical and chemical properties of stored materials may result in fires, explosions, emission of toxic gases, vapours, dusts or radiation, and various combinations of these effects. Care should be taken to provide separate storage or other special conditions, where required, for certain materials and chemicals including pesticides and herbicides. Since refrigerators are often used for the storage of highly volatile or reactive materials, it is essential that all controls, switches, etc. be explosion-proof. A current inventory list of all chemicals in stock should be maintained, and each item should be identified as to its hazard in accordance with NFPA booklet 704.
- 3.5.2 Flammable Materials - Such materials should be stored in places that are cool and adequately ventilated. Continued liaison should be maintained with the local fire prevention authorities regarding the type and disposition of such materials.
- 3.5.3 Oxidizing Materials - These are not usually combustible, but will produce oxygen for accelerated burning of combustible material, and should be stored separately. Examples of classes of such compounds are organic and inorganic peroxides, oxides, permanganates, perchlorates, and chlorates.
- 3.5.4 Water-sensitive Materials - These are materials which react with water, steam or water solutions; examples are lithium, sodium, potassium, acid anhydrides, and concentrated acids or alkalis. Because many of these materials are flammable, it is essential that the advice of the office of the Dominion Fire Commissioner be obtained regarding the installation of automatic sprinkler systems in the storage area which houses them.
- 3.5.5 Acid-sensitive Materials - Such materials react with acid and acid fumes; examples are lithium, sodium, arsenic, selenium and cyanides. Acids should not be stored close to these materials.
- 3.5.6 Toxic Hazards - These are materials which under either normal or disaster conditions, or both, can be dangerous, e.g. carbon tetrachloride and materials which are toxic because of their radioactivity. In general, materials which are toxic as stored, or which can decompose into toxic components due to contact with heat, moisture, acids or acid fumes, should be stored in a cool, well-ventilated place, out of direct sunlight, away from areas of high fire hazard. Examples of toxic materials are mercury, benzene, carbon tetrachloride and other hydro-carbons, organic nitro compounds, and organic phosphate compounds.

## CAUTION

A self-contained breathing device should be readily available where dangerous levels of noxious gases or vapours may be given off or created by stored chemicals.

### 3.5.7 Reference

"Handbook of Compressed Gases",  
Compressed Gas Association Inc.,  
Van Nostrand Reinhold Publishing  
Company,  
1410 Birchmount Road,  
Scarborough, Ontario.

"Construction Safety",  
Construction Safety Association  
of Ontario,  
74 Victoria Street,  
Toronto, Ontario.

"Accident Prevention Manual for  
Industrial Operations",  
National Safety Council,  
Chicago, Illinois. 60611

"Dangerous Properties of Industrial  
Materials",  
Van Nostrand Reinhold Publishing  
Company,  
1410 Birchmount Road,  
Scarborough, Ontario.

"Handbook of Laboratory Safety",  
The Chemical Rubber Company,  
18901 Connecticut Avenue, N.W.,  
Cleveland, Ohio. 44128

"Chemical Safety Data Sheets",  
Manufacturing Chemists Association,  
1825 Connecticut Avenue, N.W.,  
Washington, D.C. 20009

"Fire Protection Engineering  
Standards",  
Dominion Fire Commissioner.

## 3.6 Environmental Chambers

- 3.6.1 The hazards of environmental chambers are related to exposure to heat and cold (heat exhaustion, heat stroke, frostbite and

skin burns, eye damage, respiratory tract damage), and exposure to toxic gases and fumes arising from test equipment within the chamber or from escaping refrigeration gases.

3.6.2 Safety Precautions - The following safety precautions should be followed with respect to environmental chambers.

- 3.6.2.1 Maintain outside surveillance of personnel working in environmental chambers, particularly those working alone. Continuous two-way communications should be provided where practicable.
- 3.6.2.2 Personnel should be advised of temperature ranges before entering, and provided with appropriate personal protective clothing and equipment.
- 3.6.2.3 An outside warning light should indicate when someone is in the chamber.
- 3.6.2.4 An emergency alarm system, audio and visual, that can be triggered off either inside or outside the chamber, should be available and tested periodically.
- 3.6.2.5 Gasket heaters should be installed where required, and used to prevent doors from freezing shut in low-temperature rooms.
- 3.6.2.6 Safety devices such as exits and alarms, break-out tools, fire emergency equipment, emergency resuscitation, and first aid equipment should be provided, and personnel should be trained in their use.
- 3.6.2.7 Adequate ventilation should be provided.

3.6.3 References

"Cold Room Testing of Gasoline and Diesel Engines",  
Data Sheet No. 465 of 1958,  
National Safety Council,  
425 North Michigan Avenue,  
Chicago, Illinois. 60611

"Engineering Environmental Simulation Facilities", by T.R. Ringer,  
National Research Council of Canada,  
Ottawa, Ontario.  
K1A 0R6

"The New Canadian Laboratory for  
Arctic Testing", by J.L. Orr  
and D.G. Henshaw,  
National Research Council of Canada.



## CHAPTER 4

### RADIATION

4.1 This chapter sets out certain requirements concerning the design, operation and maintenance of laboratory and other facilities involved with the use of radioactive materials, X-ray emitting equipment, microwave, ultrasonic and laser radiating devices, and also the disposal of radioactive wastes. (Refer also to Chapters 2 and 6.)

4.2 All new facilities, and all modifications and additions to existing facilities, should meet the specifications described in the following documents and their subsequent amendments, which have been produced by the Radiation Protection Bureau, Department of National Health and Welfare:

- |   |                         |
|---|-------------------------|
| - X-Ray in Medical, Dental and Paramedical Diagnostic Radiology           | - Publication RPD-SC-4  |
| - Microwave Heating Appliances  | - Publication RPD-SC-6  |
| - Non-Medical Use of X-Rays   | - Publication RPD-SC-7  |
| - Medical and Non-Medical Use of Lasers                                   | - Publication RPD-SC-9  |
| - X-Rays in Medical Therapy   | - Publication RPD-SC-10 |
| - Open Beam Microwave Equipment   | - Publication RPD-SC-11 |
| - Laboratory Facilities for Handling Radioisotopes                        | - Publication RPD-SC-12 |
| - Methods for Radioactive Waste Disposal for Radioisotope Users in Canada | - Publication RPD-SC-15 |
| - Safety Procedures for the Use of Demonstration Laser Devices            | - Publication RPB-SC-19 |
| - Active Metal Detector Safety Code                                       | - Publication RPB-SC-18 |

Note: The foregoing documents do not cover all conceivable eventualities. Where assistance is required in interpretation or measurement, design or working techniques, departments should consult the Radiation Protection Bureau, Department of National Health and Welfare, Ottawa.

#### 4.3 Radioactive Materials

- 4.3.1 Publication RPD-SC-15 specifies the concentration of radioactive material which may be disposed of by such routes as burial, discharge to municipal sewers, deposition in municipal dumps, incineration, etc., and summarizes the requirements.
- 4.3.2 Publication RPD-SC-12 divides laboratories into three types for considerations of design, according to quantity of radioactivity to be used, and gives detailed specifications for two of the more common of these. These specifications are aimed at ensuring that total radiation to which staff are exposed is within the limits recommended by the International Commission on Radiological Protection, and give details of the need and performance specifications for such items as fume hoods, sinks, separate drainage systems, storage areas, special surface finishes, enclosed service conduits, etc.

#### 4.4 X-Ray Equipment and Facilities

Recommendations concerning the installation facilities, shielding and mode of use of x-ray equipment, are detailed in Publications RPD-SC-4, SC-7, and SC-10, with data included to aid the design of facilities of an acceptable standard. The x-ray equipment itself should conform to at least the minimum standards of design, construction and functioning detailed in regulations proclaimed under the Radiation Emitting Devices Act.

#### 4.5 Microwave and Laser Equipment and Facilities

RPD-SC-6, SC-9, SC-11, and RPB-SC-18 and SC-19 provide requirements for microwave and laser equipment, facilities and mode of use, similar in scope to those of item 4.4.

#### 4.6 Medical Surveillance

Members of the staff whose work involves their exposure to radioactive material or radiation are subject to medical surveillance, as specified in the Periodic Health Evaluation Standard, (TB STD 3-13) Public Service of Canada.

CHAPTER 5  
MICROBIOLOGY

This chapter is currently under revision; any specific questions on the subject of microbiology should be directed to the Medical Services Branch of Health and Welfare Canada.

## CHAPTER 6

### CONTROL, HANDLING, AND DISPOSAL OF LABORATORY WASTES

#### 6.1 Procedures and Regulations

- 6.1.1 All waste should be controlled, handled and disposed of in a manner which will not cause injury to employees or the public, or damage to property, and in compliance with applicable municipal, provincial and federal regulations or requirements.
- 6.1.2 Any procedures, directives, regulations or standards issued by a department or other authority having specific jurisdiction in respect to the control, handling or disposal of laboratory wastes (Fisheries and Environment Canada, Atomic Energy Control Board, etc.) shall take precedence over these guidelines.

#### 6.2 Identification of Disposals

- 6.2.1 The level of hazard of disposable materials should be identified on a label in four categories of health, fire, reactivity and environment, by reference to Fisheries and Environment Canada "Code of Good Practice for Management of Hazardous and Toxic Waste at Federal Establishments". Abbreviated definitions of the degree of hazard in each category follow.

##### Health

- 4. Short exposure may cause death or major injury.
- 3. Prolonged or repeated exposure may cause serious injury.
- 2. Concentrations may be toxic.
- 1. No known health hazard.

##### Fire

- 4. Very flammable gases or volatile liquids.
- 3. Liquids and solids which will burn readily under normal conditions.
- 2. Substances which must be heated before ignition can occur.
- 1. Substances which will not readily burn.

### Reactivity (Stability)

4. Readily detonates or explodes.
3. Can detonate or explode but requires strong initiating force or heating under confinement.
2. Mild reaction, unlikely to be hazardous.
1. Normally stable.

### Environment

4. Substances which cause major residual damage.
3. Substances which could cause serious damage.
2. Intense or continuous application could cause residual damage.
1. No environmental hazard.

- 6.2.2 When labelling a material with respect to hazard, consideration should be given to hazards arising from contact with other substances during disposal, and hazards produced by the disposal procedure. The material should be labelled according to the highest hazard which might be encountered from it during disposal.

## 6.3 Storage and Disposal

- 6.3.1 The collection and segregation for disposal of all waste originating within a department's laboratories, offices, and workshops, and the disposal of all unidentifiable waste, remains the responsibility of that department, through the person in charge.
- 6.3.2 The individual scientist or laboratory technician is responsible for rendering safe what are considered hazardous materials before placing them in the collection area for pickup or disposal.
- 6.3.3 When explosive or poisonous materials are synthesized in a laboratory, the product should be identified prior to disposal.
- 6.3.4 Where the disposal of wastes presents special problems (e.g. emission of poisonous gases when being burned), detailed procedures and instructions on their disposal should be specified for the person responsible for the actual disposal.

6.3.5 Waste materials should not be accumulated in laboratories or storage areas. Particular attention should be given to those materials that tend to develop explosive properties over a period of time, and to those materials bearing a date beyond which the material should not be retained.

6.3.6 Combustible Waste - This waste should be kept in a storage locker which is not adjacent to buildings. The storage locker should be of fire-resistant material, well ventilated, and marked as follows "Flammable Material - Danger - Keep Away", and/or in accordance with applicable standards provided by the office of the Dominion Fire Commissioner. The storage lockers should be equipped with suitable locks.

6.3.7 Solid Waste - This is best divided into three classes:

(a) Glass

(b) Combustibles

(c) Non-combustibles (excluding glass)

Suitably lettered and colour-coded containers are a convenient method of providing receptacles for solid waste. However, care should be taken not to introduce heated or unstable materials without removing the hazard, i.e. they should be cooled or decomposed.

6.3.8 Venting of Gaseous Waste - The emptying of gas cylinders can be very hazardous, and in most cases the advice of a scientist, a laboratory technician or a safety officer should be sought beforehand. In venting gaseous waste products from a reaction, arrangements should be made for the gas either to enter the fume extraction system or to be led directly outside the building. Care should be taken to ensure that the system can deal with the waste products, and produce an effluent that is toxicologically acceptable.

6.3.9 Liquid Wastes - Materials immiscible with water, flammable liquids or solutions containing cyanides and chromates, should never be discarded into drains or ditches. Incompatible materials should be kept separately and disposed of separately. Random bulking of waste liquids can be very dangerous.

Some wastes may be disposed of by diluting with sufficient water and flushing into the sewage system. Materials that can be disposed of in this way should be so designated, by the person in charge. Used oils and hydrocarbons may have commercial value and, if so, should be stored in suitable receptacles for ultimate disposal. Oil that is highly contaminated (i.e.

more than thirty per cent by volume) with solvents or other chemicals, or with extremely hazardous materials at any concentration, should be classified as chemical waste and handled accordingly).

- 6.3.10 Burning - The burning of material for disposal should be carried out in an approved incinerator. The Environmental Protection Service (EPS) will provide assistance to individual facilities in developing handling procedures for, and disposal of, hazardous and toxic waste by open pit burning.

#### 6.4 Additional Information

For further information on the hazards of a specific chemical substance and recommendation for its disposal as a laboratory waste, reference should be made to the Environmental Protection Service of Fisheries and Environment Canada, and to the Laboratory Waste Disposal Manual, Second Edition (1969) published by the Manufacturing Chemists Association, Washington, D.C.

#### 6.5 References

"Laboratory Waste Disposal Manual",  
Manufacturing Chemists Association,  
1825 Connecticut Ave. N.W.,  
Washington, D.C. 20009

"Precautionary Labeling of Hazardous  
Chemicals",  
Manufacturing Chemists Association.

"Chemical Safety Sheets",  
Manufacturing Chemists Association.

"Poisons: Properties, Chemical Identification,  
Symptoms and Emergency Treatment",  
Vincent J. Brookes and Morris B. Jacobs,  
2nd Edition, 1958,  
Van Nostrand Reinhold Publishing Company,  
1410 Birchmount Road,  
Scarborough, Ontario.

"Dangerous Properties of Industrial  
Materials",  
N. Irving Sax, 3rd Edition,  
Van Nostrand Reinhold Publishing  
Company.

"National Fire Codes" (Vol. 15-1975),  
National Fire Prevention Association,  
470 Atlantic Avenue,  
Boston, Mass. 02210

"Code of Good Practice for Management of  
Hazardous and Toxic Waste of Federal  
Establishments",  
Environmental Protection Service,  
Fisheries and Environment Canada.

"Code of Good Practice for Handling Solid  
Waste at Federal Establishments",  
Environmental Protection Service,  
Fisheries and Environment Canada.



## CHAPTER 7

### FIRST AID - HEALTH AND MEDICAL SERVICES

- 7.1 The provisions of first aid facilities, and the training of employees in first aid, should follow the requirements outlined in the "First Aid Standard (TB STD 3-5) - Public Service of Canada". All other applicable and authorized standards, or special instructions concerning first aid equipment and procedures particular to each laboratory operation, should be available for reference by laboratory staff.
- 7.2 Where it has been determined that special first aid facilities, supplies and training are required, advice and arrangements for such supplies or training should be obtained through the nearest Regional Medical Services office of the Department of National Health and Welfare.
- 7.3 Laboratory employees are subject to periodic health evaluations where required, in accordance with the "Periodic Health Evaluation Standard (TB STD 3-13) - Public Service of Canada".
- 7.4 Suspected or potential health or environmental hazards in laboratories should be investigated in accordance with the procedures outlined in the Handbook of Occupational Health and Safety Policies, Standards and Guides.

## CHAPTER 8

### FIRE PREVENTION AND EMERGENCY PROCEDURES

- 8.1 Fire prevention and protection in the Public Service is under the jurisdiction of the Dominion Fire Commissioner.
- 8.2 Measures concerning fire prevention and protection should be in compliance with the National Fire Codes of the National Fire Prevention Association, Fire Protection Technical Information Bulletins and the Fire Protection Engineering Standards issued by the Dominion Fire Commissioner. It is the responsibility of the person in charge to ensure that all possible precautions are taken to prevent fires and explosions.
- 8.3 Where specific hazards may require emergency evacuation of staff, or other special safety measures, a disaster plan should be developed and approved by or in cooperation with the person in charge. This plan should be updated as necessary, and evacuation and/or disaster procedures should be rehearsed on a regular basis.

A GUIDE TO  
ACCIDENT INVESTIGATION

TB GUIDE 5-2

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## ACCIDENT INVESTIGATION

### Definition

"The determination of the facts of an accident by inquiry, observation, and examination and an analysis of these facts to establish the causes of the accident and the measures that must be adopted to prevent its recurrence."

### Introduction

An effective accident-investigation, record-keeping and reporting system is the heart of a safety program. It facilitates the identification of health and safety hazards, enables the design and provision of preventive measures, and helps determine overall safety program priorities. Most importantly, an accident investigation that is properly and efficiently carried out and is followed by prompt remedial action is one of the most effective methods of reducing accidents.

An accident investigation has two purposes: to determine why the accident happened by identifying all work-related facts associated with it and to subsequently modify work conditions and procedures to prevent a similar occurrence. The supervisor responsible for the work must be totally committed to the accident investigation program. These guidelines are based on that premise.

### Departmental Responsibility\*

Each department and agency is responsible for ensuring that work accidents occurring within its jurisdiction are, in accordance with these Procedures, investigated, recorded and reported, the causes determined and appropriate measures taken to prevent similar occurrences. Accordingly, appropriate departmental directives and procedures shall be established and maintained to ensure that:

- . an effective investigation of each work accident is, in accordance with these Procedures, conducted and completed within seven working days of the occurrence, and the cause or causes determined;
- . prompt action is taken to effect, to the extent that is reasonably practicable, recommended changes in physical conditions or work procedures arising from such investigations; and
- . the required recording and reporting procedures are followed.

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\* Extract from "Investigation, Recording and Reporting of Work Accidents and Injuries - Procedures (TB PROC 4-1)".

## SECTION 1

### THE INVESTIGATOR

#### The Supervisor

The supervisor, by the nature of his or her position and its inherent responsibilities, possesses a detailed knowledge of the work and the conditions under which it is done and is the appropriate person to undertake the accident investigation. Primary responsibility for investigation should, therefore, rest with the supervisor. Acceptance of this responsibility by each supervisor, combined with a personal commitment to the time and effort involved in such investigations, is required if the program is to operate effectively. The supervisor's responsibility extends beyond determining the cause of the accident and includes exercising supervisory responsibilities to ensure that proper remedial action is promptly taken.

#### Technical Advisers and Specialists

When investigating accidents of a serious nature, or those which involve highly technical processes, it may be appropriate to engage the services of a technical adviser or other specialist with specialized knowledge of an operation or equipment to assist in the investigation. An "outside" specialist may also provide an additional degree of objectivity to the investigation. When such a person is authorized to conduct or assist in an investigation, it should be carried out in collaboration with the responsible supervisor.

#### Safety Officer

When available, the organization's safety officer can offer guidance in coordinating an accident investigation. The safety officer cannot be expected to provide technical advice on every operation or to take the place of the responsible supervisor concerning the detailed work operation or procedures. The officer can, however, often help to determine the cause of an accident, as a result of general knowledge and experience with similar accidents and their causes.

#### Team Approach

The investigation should be carried out by the supervisor directly responsible for the work at the time of the accident. Such investigation may be all that is required to establish the causes and to prescribe corrective action. However, in the event of a serious accident, and particularly when the causes are not readily determinable, a team approach may be advisable. The team would include the supervisor in every case, and other qualified personnel such as the safety officer, technical specialists, and depending on local departmental practice, a member of the local safety committee. It is the supervisor's responsibility to assess his or her own ability to investigate an accident and decide on the extent of backup required.

## SECTION 2

### THE ACCIDENT INVESTIGATION

#### Purpose of Investigation

The primary purpose of the accident investigation is to establish the causes as quickly as possible through the identification and examination of all information associated with the accident. The ultimate purpose is to make the required changes in the work conditions and procedures that will eliminate or reduce the risk of a similar occurrence.

#### Definition of Accident

For purposes of this Guide, an accident is defined as an event that results in an occupational injury, property damage, or material loss (material loss in this case does not include loss resulting from fire or non-accidental causes such as theft). Occupational illnesses should be investigated in the same manner and context as an accident, and the date on which the illness was discovered or reported is considered to be the "date of accident".

#### Fact-Finding Only

The investigation should be undertaken in a constructive spirit. It is not a fault-finding exercise, and irrespective of the causes determined or the involvement of various personnel, the occasion should not be used for apportioning blame. In establishing the existence of human error, such actions should be dealt with objectively.

#### Consideration of Information

As soon as possible after the accident, all information relating to the accident should be obtained and a conclusion reached concerning the causes. The investigator should, however, be cautious about accepting incomplete conclusions as the basis for establishing the cause. A normal tendency to reinforce pre-conceived thoughts as to the probable cause should also be resisted. When original factual evidence is not available, conclusions should be based only on substantiated facts or on the best possible logical assumptions. Circumstantial evidence should only be considered, with extreme caution, when no other evidence exists.

#### Planned Approach to Investigations

Each organization should institute a planned approach to accident investigations supported by general internal procedures, as necessary, to guide supervisors. Fundamentally, such a planned approach should incorporate the following sequence of actions:

- prevent the removal of evidence or the change of conditions at the work scene;

- . determine the specified work procedure;
- . verify evidence of the witnesses and, if possible, the injured employee;
- . record results of special tests or re-enactments;
- . review and select relevant findings and establish causes;
- . recommend appropriate changes based on the conclusions; and
- . carry out the changes recommended to prevent a recurrence of the accident.

### Action Following Accident

A planned system of approach incorporating these actions will help to ensure that each accident investigation is carried out in an orderly and effective manner. More detailed guidelines respecting each phase of the investigation follow:

- . Depending on the seriousness of the accident, the scene of the accident should be isolated as much as possible. If someone is injured, immediate medical attention should be given. Ensure that the scene of the accident remains undisturbed.
- . In serious accidents, or when the exact physical situation cannot be maintained for the investigation, a sketch should be prepared and, if possible, photographs taken as soon as possible.
- . The names and addresses of all witnesses should be obtained immediately.
- . If there is a possibility that any circumstances surrounding the accident may constitute an imminent danger to anyone, action should be taken (without awaiting the final outcome of the investigation) to remove the apparent hazard or temporarily discontinue the work under investigation.
- . The investigation should proceed as soon as possible after the accident.

### Investigation Interviews

Personnel involved in the accident, including witnesses and, if possible, the injured employee, should be interviewed as soon as possible following the accident, while the events are still clear in their minds, and the resulting information and statements should be recorded in writing. In many cases the injured employee will be the principal source of information.



Before interviews take place, however, the investigator should ensure that he or she is thoroughly familiar with the approved procedures governing the work being performed at the time of the accident.

Any person directly involved should be interviewed first, to determine what was being done before the accident; this should be followed by interviews with co-workers involved or associated in the operation, or in the immediate vicinity. In most circumstances, it is advantageous to interview each person separately.

Before interviewing the injured employee, the investigator should obtain assurance that the interview is medically permissible. Basic information relative to the employee, his or her injury, or other circumstances, should be obtained before the interview. (If the employee's answers vary considerably from known information, the person's physical condition may be such that questioning is inappropriate at that time.)

Proper interview techniques are important. Normally, for example, it is well to remind the person being interviewed of the constructive purpose of the investigation. The investigator should do everything reasonable to put the person at ease and should never appear hostile. Ask the person what happened and try not to interrupt. When more information is needed, it is usually better not to pose direct questions but to ask for clarification of key points. Also ask any pertinent questions required to complete the Supervisor's Accident Investigation Report.

#### Cause Categories

The two principal cause categories are personal actions by the injured or by someone else, and environmental conditions surrounding the work.

In many accidents a combination of the effects of both cause categories may be evident, and a careful appraisal of the sources of such factors should disclose all of the underlying contributory causes.

A considerable number of potential causes of accidents, arising both from unsafe acts and unsafe conditions, have been identified and catalogued. A list of these is provided in Appendix A of this Guide, as an aid to investigators. (Refer also to Section 5 of this Guide "Contributory Causes and Factors", for additional information.)

#### Determination of Causes

The specific work procedure (whether right or wrong) that was being performed by the employee at the time of the accident should be determined. The employee's actions immediately before the accident should be compared with the approved procedure for that job. One should attempt to establish and record (in written form) whether the employee lacked skill, knowledge, training, or awareness. Did the employee take a shortcut in an attempt to avoid inconvenience or discomfort? Was the job being performed covered by a safety rule or standard and, if so, was there a deviation from the standard?

It should be determined whether the employee's work environment contributed to the accident. Were there any defects or deviation from approved conditions in respect to tools, equipment, vehicles, or the surrounding work area? If a faulty condition is detected, it should be determined whether the condition was caused by normal deterioration, excessive use, abuse, or faulty design.

#### No Substantiated Causes

Occasionally, investigators may be unable to decide on the cause. For example, key facts or supporting details may be absent in relation to the type of accident and the injury, or to the employee's version of these. In some instances it may be found also that the type, location, or severity of injury cannot be related to the circumstances of the work or to the accident. In such situations the supervisor should extend the investigation to verify that the accident and the injury occurred as described. If such verification cannot be made, the investigation report should indicate this. Supervisors should also bring such cases to the attention of the person or persons responsible for reporting the injury for purposes of Workmen's Compensation (Government Employees Compensation Act), and provide the essential information concerning lack of verification for inclusion in the applicable Workmen's Compensation Accident or Injury Report or other form specified for this purpose.

#### Caution

Occasionally it may be useful to re-enact certain elements of the operating procedure, or test equipment under similar conditions of use. In such an event, proceedings should be carried out with extreme caution, briefing the participants fully on the relative hazards and on the safe procedures to be followed. It should be verified that in the event of an accidental deviation from the work procedure or the failure of some equipment, there would be no possibility of damage or injury. If there is any doubt about the safety of a re-enactment it should not be carried out.

#### Final Recommendations

Once the error that may have contributed to the cause of the accident has been identified, it is the responsibility of the supervisor, supported where necessary by the investigation team, to prescribe the action that must be taken, based on the findings of the investigation, to rectify the hazard or reduce the risk of a similar accident (see Section 3, "Corrective Action"). Once action is recommended, it is the responsibility of local management to review and to change the work procedures or equipment appropriately, and to provide for ongoing monitoring and inspection systems to maintain the work in safety.

### SECTION 3

#### CORRECTIVE ACTION

##### Physical Conditions

If the investigation revealed that the cause of the accident was related to physical or environmental conditions, action should be taken, as appropriate, to:

- . modify or change facilities or personal equipment or other physical elements at the work location to eliminate or minimize the hazards concerned;
- . undertake special technical studies, tests, analyses, or initiate manufacturing or design inquiries.

##### Personal Action or Inaction

If the accident investigation revealed that someone's action or inaction contributed to the accident, the following steps may be appropriate:

- . revise the job procedure;
- . undertake the safety training or instruction of all employees involved in similar operations;
- . undertake campaigns to ensure employees' compliance with safety procedures or standards;
- . seek professional medical advice when an underlying mental or physical problem of the employee is suspected;
- . publicize facts and causes of the accident among other supervisors and employees who may be subject to similar hazards.

##### Supervisor's Responsibilities

In addition to the primary responsibility for ensuring that the accident investigation is carried out, the supervisor is responsible for taking whatever immediate corrective action is authorized within the scope of his or her own authority.

Should any changes in procedures or conditions be required that are beyond the supervisor's assigned authority to approve, recommendations concerning them should be made to higher management in accordance with local departmental procedures. The supervisor should clearly state what is being recommended and give reasons in support of the recommendations to prevent recurrence of the accident.

### Unit or Division Head's Responsibilities

The term unit head or division head signifies the level of management to which the first-line supervisor generally reports. The unit head should review the corrective action recommended by the supervisor, as recorded on the Supervisor's Accident Investigation Report form and other supporting documents.

It is usually the unit or division head's responsibility to decide what action is to be taken with respect to any changes recommended by the investigating supervisor. If further study is indicated regarding a proposed change, personal responsibility should be assigned to someone for conducting the study, and a completion date should be established.

The unit or division head should indicate approval or concurrence in writing, with the recommendations made and action to be taken. This practice ensures that this level of management is completely familiar with the accident and its details. It also enables the unit or division head to assess the supervisor's acceptance of responsibility and commitment, to concur with the supervisor's findings, and to add any comments.

## SECTION 4

### THE ACCIDENT INVESTIGATION REPORT

#### General

The Supervisor's Accident Investigation Report form is the basic vehicle for providing and summarizing all the facts relating to the accident. Its systematic use is essential in giving line supervisors and managers the opportunity to propose corrective action and to formally indicate their commitment to follow up the corrective measures.

The supervisor in charge of the work is responsible for the completion of the accident investigation report, and the data ultimately recorded on the report form are the end result of the completed investigation process. The report should not be regarded as final until the investigation has been completed, the results (including the corrective action to be taken) recorded, and the report signed by the supervisor. (The accident investigation report should not be confused with the accident report form used for reporting an injury for purposes of Workmen's Compensation pursuant to the Government Employees Compensation Act.)

#### Public Service Mandatory Reporting Requirements

In accordance with the requirements of the procedures for the Investigation, Recording and Reporting of Work Accidents and Injuries (TB PROC 4-1), an investigation is to be carried out and a Supervisor's Accident Investigation Report form completed in the case of every work accident resulting in:

- . a fatal injury;\*
- . a disabling injury, i.e., an occupational injury or an occupational illness that requires professional medical attention and that, according to written medical authorization, prevents the employee from returning to work on the next regular shift or subsequent workday;\*
- . any occurrence that requires rescue, revival, or other emergency measures, or occurrences that cause an employee to lose consciousness, such as exposure to an oxygen-deficient or toxic atmosphere, or electrical shock;\* or
- . property damage or material loss (including damage to mobile equipment), the repair or replacement of which is estimated to cost \$500 or more.

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\* These categories require that a copy of the report be forwarded to the appropriate District or Regional Office of Labour Canada as soon as possible following completion of the accident investigation.

### Departmental Option

In the case of the following types of work accidents and injuries, detailed procedures concerning the supervisor's investigation shall be determined by each department or agency, according to its own operating requirements:

- non-disabling injuries, i.e., occupational injuries or occupational illnesses that require professional medical treatment but do not cause the employee to be absent from work beyond the day or shift on which such injury or illness occurred;
- accidents causing property damage or material loss, the cost of which is estimated to be less than \$500; or
- any other incident or occurrence, the circumstances of which could have resulted in a disabling injury, or property damage or material loss of \$500 or more.

### Distribution of Reports

The appropriate distribution of the completed accident report form is the principal method of publicizing and disseminating the accident investigation information to those involved in the operation, coordination, maintenance, or monitoring of the safety program. Distribution should take place as follows:

- copies of the Supervisor's Accident Investigation Report shall be forwarded to appropriate levels of management, safety and health committees, safety officers, and elsewhere, according to the safety program requirements of the department; and
- it is also a requirement that the appropriate District or Regional Office of Labour Canada be informed of any fatal accident within 24 hours of its occurrence.

### The Public Service Report Form

The standard form recommended for the Public Service is the Supervisor's Accident Investigation Report, form TB 330-10 (see Appendix B), which has been designed and specified for use in support of the accident prevention program and is available through Supply and Services Canada.

### Completion of Report Form

It is essential that each section of the report form be fully completed and that details be recorded accurately. If this is not done, the appropriate use of the report may be prejudiced, and the value of the entire investigation negated. The following general guidelines for completing the report form correspond to sections of the standard Public Service form.

## SECTION A

### General Information

- This section consists of basic employee personal and identifying data, which can usually be obtained from the department's local personnel records.

## SECTION B

### Investigation of Accident

- In recording the sequence of events leading to an accident, a clear and concise statement should be provided. If extensive additional notes and comments have been made during the investigation, they should be condensed and may be attached to the report.
- In most situations it is helpful to provide a sketch or photograph.
- Comments on any unsafe physical conditions or acts should be included. Subsequent recommendations for change should be based on these facts.

## SECTION C

### Property Damage

- Describe the type and extent of property damage in as much detail as space will allow.
- Obtain, if possible, the actual costs or an estimate of the cost of repairing the damaged property to its original condition, and indicate this amount on the form.
- If there is no materiel or equipment damage caused in the accident, indicate this.

## SECTION D

### Sketch of Accident

- Refer to Section B, "Investigation of Accident".

## SECTION E

### Preventive Action

- When remedial action has been initiated following a brief investigation after the accident, the action taken should be indicated in the space provided.
- When corrective action or preventive measures of a more extensive nature are required, recommendations concerning them should be inscribed in the appropriate space in sufficient detail.

- Where appropriate, immediate or interim action and completion dates should be designated with respect to the implementation of each corrective measure, and this should be followed up.

#### Management Comment

The responsible senior manager at each work location should review the form, provide comments, and sign it. These comments should state or confirm the action to be undertaken to prevent a similar accident. Where necessary, the manager should assign specific responsibility to the appropriate person to ensure that the required changes will be made, and should follow up such action personally.

#### Use of Report by Safety Personnel

Departmental safety officers should receive or have access to copies of all Supervisor's Accident Investigation Reports. Such reports provide the safety officer with a good deal of valuable information concerning the general status of the organization's safety program and, more specifically, are useful in the following applications:

- . to provide information concerning the efficacy of the accident investigation program, thereby evaluating safety performance and progress at various locations;
- . to evaluate the types of accidents and their severity, thus providing information to the safety officer for use in his or her management advisory role;
- . to provide a basis for the completion of statistics, identifying accident trends, and denoting possible deficiencies in the safe supervision of the work;
- . to indicate when special safety surveys and inspections may be required, or to identify the requirements for a review of job safety procedures, or to initiate special studies.



## SECTION 5

### CONTRIBUTORY CAUSES AND FACTORS

As previously referred to in this Guide, it is often determined that accidents are caused by more than one unsafe act or condition, and in combination with a number of underlying, less evident contributory factors. These contributory factors or causes may arise from particular defects in the organization or from personnel actions or both. The following accident description may help to demonstrate this:

"The operator of a circular saw reached over the running saw to pick up a piece of scrap which was lodged near the saw blade. His hand touched the blade, which was not guarded, and his thumb was amputated."

The Unsafe Condition - an unguarded saw.

The Unsafe Act - cleaning or clearing a moving machine.

#### Possible Contributory Factors

- . Existence and tolerance of an unsafe condition (unguarded saw blade).
- . Failure to establish and enforce safe operating rules (rules should prohibit cleaning a running or moving machine).
- . Disregard of job safety instructions (if an instruction existed stating that the machine must be stopped before cleaning).
- . Lack of knowledge or training (operator unaware of safe practice, i.e. the need to stop machine before cleaning).
- . Lack of routine safety inspection (which would have identified the unsafe condition and action).

It is apparent from this example that the elementary identification of the unsafe condition or act will not suffice for corrective action. The underlying contributory factors or reasons for the unsafe condition and the unsafe act should be established in order to determine and provide the appropriate corrective measures.

In the example outlined above, the recommendations might include the following:

- . that guards be designed and maintained in place on this and other similar equipment;
- . that job safety training be undertaken to stress that moving machinery must be stopped and safely secured before cleaning or other maintenance;

- . that supervisors enforce observance of the above requirement;
- . that appropriate signs or directives be prepared and posted where the employees may be reminded of the safe procedures to be followed; and
- . that routine inspections be arranged to ensure maintenance of required safety conditions and procedures.

An investigation is neither successful nor complete until all the possible causes and contributory factors are considered, and the actual causes identified and acted upon.

APPENDIX A  
A LIST OF FACTORS  
CONTRIBUTING TO ACCIDENTS

1. UNSAFE CONDITIONS

Inadequate guarding

Guard weak, defective, poorly designed  
Inadequately guarded  
Improper shoring in mining, construction, excavating

Defective

Tough  
Slippery  
Sharp-edged  
Poorly designed  
Low material strength  
Poorly constructed  
Inferior composition  
Decayed, aged, worn, frayed, cracked

Hazardous arrangement or procedure

Unsafely stored or piled tools or material  
Congestion of working space  
Inadequate aisle space or exits  
Unsafe planning or layout of traffic or process operations  
Unsafe processes  
Overloading  
Misaligning  
Inadequate drainage

Improper illumination

Insufficient light  
Glare  
Unsuitable location or arrangement (producing shadow or contrast)  
No light

Improper ventilation

Insufficient air changes  
Unsuitable capacity, location, or arrangement of system  
Impure air source  
Abnormal temperature and humidity (confined area)

### Unsafe dress or apparel

No goggles or face shields  
Goggles or face shields defective, unsafe, or unsuited for work  
No gloves or mitts  
Gloves or mitts defective, unsafe, or unsuited for work  
No apron  
Apron defective, unsafe, or unsuited for work  
No shoes  
Shoes defective, unsafe, or unsuited for work  
No respirator  
Respirator defective, unsafe, or unsuited for work  
High heels  
Loose hair  
Loose clothing  
Inadequately clothed  
No leggings  
Leggings defective, unsafe, or unsuited for work  
Lack of protective headgear or hard hat unsafe or unsuited for work  
No welder's helmet or hand shields  
Welder's helmet or hand shields defective, unsafe, or unsuited for work  
No welder's protective clothing (spats, capes, sleeves, jackets, and other) or protective clothing defective, unsafe, or unsuited for work  
No babbiting mask  
Babbiting mask defective, unsafe, or unsuited for work  
No safety belts  
Safety belts defective, unsafe, or unsuited for work

### Unguarded

Lack of guard, screen, enclosure, barricade, fence, insulation, railing, rope (as opposed to inadequate guarding)

### Unsafe design or construction

Hazard built into new equipment or structures  
Faulty architecture, design, or engineering  
Faulty assembly, manufacture, or construction (as opposed to defective through wear and tear or abuse)

## 2. UNSAFE ACTS

### Operation without authority, failure to secure or warn

Starting, stopping, using, operating, firing, moving, without authority or without giving proper signal  
Failing to lock, block, or secure vehicles, switches, valves, press rams, other tools, materials, and equipment against unexpected motion, flow of electric current, steam

Failing to shut off equipment not in use  
Releasing or moving leads without giving warning  
Failing to place warning signs, signals, tags  
Failure of crane signalman to give proper signal

Operating or working at unsafe speed

Running  
Feeding or supplying too rapidly  
Driving too slowly  
Throwing material instead of carrying or passing it  
Jumping from vehicles or platforms  
Walking backwards  
Working too fast or too slowly (endangering self and others)

Making safety devices inoperative

Removing safety devices  
Blocking, plugging, tying of safety devices  
Replacing safety devices with those of improper capacity (higher amperage electric fuses, low-capacity safety valves)  
Misadjusting safety devices  
Disconnecting safety devices  
Failing to secure safety devices

Using unsafe equipment, using hands instead of equipment, or using equipment unsafely

Using defective equipment (mushroom head chisels)  
Unsafe use of equipment (e.g. using iron bars for tamping explosives, operating pressure valves at unsafe pressures or volume)  
Gripping objects insecurely or improperly

Unsafe loading, placing, mixing, combining

Overloading  
Crowding or unsafe piling  
Lifting or carrying too heavy loads  
Arranging or placing objects or material unsafely (parking, placing, stopping, or leaving vehicles, elevators, and conveying apparatus in unsafe position for loading and unloading)  
Injecting, mixing, or combining one substance with another so that explosion, fire, or other hazard is created (injecting cold water into hot boiler, pouring water into acid)  
Introducing objects or materials unsafely (portable electric lights inside boilers or in spaces containing inflammables or explosives; moving equipment in congested workplaces; smoking where explosives or inflammables are kept)  
Placing or leaving on working surfaces (tools, materials, debris, rope, chain, hose, electrical leads)  
Oil, water, grease, paint on working surfaces

### Taking unsafe position or posture

Exposure under suspended loads (fixed or moving)

Putting body or parts of body into shaftways or openings; standing too close to openings; walking on girders, beams, or edges of working surfaces when not necessary; not using proper methods of ascending and descending

Entering vessel or enclosure when unsafe because of temperature, gases, electric, or other exposures

Working on high-tension conductors from above instead of below

Lifting with bent back or while in awkward position

Riding in unsafe position (on platforms, tailboards, and running boards of vehicles; tailing on or stealing rides, riding on apparatus designed only for materials)

Exposure on vehicular right of way

Passing on grades and curves, cutting in and out, road hogging

Exposure to falling or sliding objects

### Working on moving or dangerous equipment

Getting on and off moving equipment (vehicles, conveyors, elevators)

Cleaning, oiling, adjusting of moving equipment

Caulking or packing of equipment under pressure (pressure vessels, valves, joints, pipes, fittings)

Working on electrically charged equipment (motors, generators, lines, or other electrical equipment)

Welding or repairing of equipment containing dangerous chemical substances

### Distracting, teasing, abusing, startling (horseplay)

Calling, talking, or making unnecessary noise

Throwing material

Teasing, abusing, startling, horseplay

Practical joking

Quarrelling or fighting

### Failure to use safe attire or personal protective devices

Failing to wear goggles, gloves, masks, aprons, shoes, leggings, protective hats

Wearing high heels, loose hair, long sleeves, loose clothing

Failure to report defective safety apparel

## 3. REASONS FOR SOME UNSAFE ACTS AND CONDITIONS

### Possible Personal Defects

Improper attitude

Conflicting motivations

Violent temper

Absentmindedness

Wilful intent to injure  
Nervous, excitable  
Failure to understand instructions, regulations, and rules  
Wilful disregard of instructions, regulations, and rules  
Lack of knowledge or skill  
Unaware of safe practice  
Unpractised or unskilled

#### Bodily Defects

Defective eyesight  
Defective hearing  
Muscular weakness  
Fatigue  
Existing hernia  
Crippled  
Existing heart disease or other organic weakness  
Intoxicated  
General physical condition not adapted to job  
Bodily defects  
Existing injury (cut, laceration, bruise)

#### Possible Organizational Defects

Lack of safe job procedures  
Inadequate training  
Failure to establish and enforce safety rules  
Inadequate supervisory training  
Tolerance of unsafe conditions  
Inadequate design or layout (engineering)  
Inadequate inspection program  
Inadequate preventive maintenance program  
Inadequate safety standards for purchasing





## APPENDIX B

PUBLIC SERVICE OF CANADA  
FONCTION PUBLIQUE DU CANADASUPERVISOR'S ACCIDENT INVESTIGATION REPORT  
RAPPORT DU SURVEILLANT: ENQUÊTE SUR UN ACCIDENT

## A. GENERAL INFORMATION - RENSEIGNEMENTS GÉNÉRAUX

NAME - NOM Martin, Joseph		JOB CLASSIFICATION - CLASSIFICATION DU POSTE Carpenter		FILE - DOSSIER 78-10
DEPT. OR AGENCY - MINISTÈRE OU DÉPARTEMENT Public Works		DIVISION, BRANCH OR UNIT TION, OU SOUS-SECT. Western Region		ACC. NO. - N° D'ASSURANCE 304-438-307
LOCATION OF ACCIDENT (CITY, TOWN, AREA) - LIEU D'ACCIDENT (VILLE, VILLAGE, RÉGION) Edmonton - Workshop		DATE AND TIME - DATE ET HEURE Jan. 31/78 - 0910 a.m.		DATE OF LAY-OFF - DATE DE MISE EN DISPONIBILITÉ Feb. 1/78
DATE REPORTED TO SUPERVISOR - DATE DU RAPPORT AU SURVEILLANT Jan. 31/78		PERSON REPORTING ACCIDENT - PERSONNE SIGNALANT L'ACCIDENT J.P. Robert - Workshop Supervisor		
NATURE AND EXTENT OF INJURY - NATURE ET GRAVITÉ DE LA BLESSURE Left thumb amputated at the first joint and left forefinger lacerated.				
NAMES AND LOCATION OF WITNESSES - NUS SE TROUVAIENT LES TÉMOINS ET LEURS NOMS J. Cartier - Edmonton Workshop				

## B. INVESTIGATION OF ACCIDENT - ENQUÊTE SUR L'ACCIDENT

DESCRIBE SEQUENCE OF EVENTS LEADING TO ACCIDENT (NAME TOOLS, MACHINES, MATERIALS USED, ETC., AND SKETCH ON REVERSE SIDE IF NECESSARY). DÉCRIVEZ LA SÉRIE DES ÉVÉNEMENTS QUI ONT ENTRAÎNÉ L'ACCIDENT (MENTIONNEZ LES OUTILS, MACHINES, MATÉRIEAUX UTILISÉS, ETC., LE CAS ÉCHÉANT, FAIRE UN CROQUIS AU VERSO).	
The injured man was working at a circular saw, cutting 2-inch lumber. While he was reaching over the saw to clear a piece of scrap, he contacted the running saw blade with his left thumb and forefinger.	
LENGTH OF TIME EMPLOYEE HAS BEEN DOING THIS TYPE OF WORK DEPUIS QUAND L'EMPLOYÉ FAITAIL CE GENRE DE TRAVAIL 3 years	WAS THIS PART OF HIS REGULAR DUTY? - LE TRAVAIL FAISAIT-IL PARTIE DE SES FONCTIONS RÉGULIÈRES? Yes
DESCRIBE ANY UNSAFE MECHANICAL OR PHYSICAL CONDITION INVOLVED IN ACCIDENT. DÉCRIVEZ TOUTES LES CONDITIONS DANGEREUSES MÉCANIQUES OU PHYSIQUES QUI ONT PU CONTRIBUER À L'ACCIDENT. Saw was unguarded and running.	
DESCRIBE ANY UNSAFE ACT INVOLVED IN ACCIDENT DÉCRIVEZ TOUT ACTE DANGEREUX QUI A PU CONTRIBUER À L'ACCIDENT Clearing a moving machine.	

## C. PROPERTY DAMAGE - DOMMAGES À LA PROPRIÉTÉ

DESCRIBE DETAILS OF PROPERTY DAMAGE - DÉCRIVEZ EN DÉTAIL LES DOMMAGES CAUSÉS À LA PROPRIÉTÉ Nil
ESTIMATED COST OF REPAIRS OR REPLACEMENT - COÛT ESTIMATIF DES RÉPARATIONS OU DU REMPLACEMENT N/A

TB 330-10

7540-21-029-0179

SKETCH OF ACCIDENT - CROQUIS DE L'ACCIDENT IF REQUIRED - SI NÉCESSAIRE

#### PREVENTIVE ACTION - MESURES PRÉVENTIVES

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- RECOMMENDATIONS FOR FURTHER CORRECTIVE ACTION NECESSARY TO PREVENT RECURRENCE - AUTRES MESURES PREVENTIVES RECOMMANDEES

- J.P. Robert

DATE: February 5, 1978

DECLASSIFICATION AND DECLASSIFICATION - SIGNATURE ON SURVEILLANCE

MANAGEMENT COMMENT - OBSERVATIONS DE LA GESTION

Agree with recommendations above. Arrange for guards on an urgent basis and advise me when the installation is completed. Arrange training sessions as needed and modify training procedures and manual to ensure this item is fully covered.

DATE: February 7, 1978

E. M. Roger

SIGNATURE AND TITLE - SIGNATURE ET TITRE

SAFETY GUIDE  
FOR  
OPERATIONS OVER ICE

TB GUIDE 5-3

# SAFETY GUIDE FOR OPERATIONS OVER ICE

## CHAPTER 1

### Introduction

#### 1.1 General

- 1.1.1 Ice covers are used for transportation routes, as a surface on which structures can be erected, and for the temporary storage of materials.
- 1.1.2 This Guide is concerned primarily with freshwater ice bridges, which are intended to support a gross vehicle weight of no more than 25 tons (22.5 tonnes). An ice bridge can be a natural untouched ice cover, a built-up, or a combined reinforced and built-up crossing route.
- 1.1.3 When loads are expected to exceed 25 tons (22.5 tonnes) or when operations will be conducted over saltwater ice covers, advice should be sought from the Geotechnical Section, Division of Building Research, National Research Council of Canada, Ottawa, Ontario, K1A 0R6.
- 1.1.4 Information on the safe use of ice covers for aircraft operations is available from Transport Canada.

#### 1.2 Purpose

- 1.2.1 The purpose of this Safety Guide is to:
  - (a) specify rules of good safety practice for all Public Service employees engaged in operations on ice covers;
  - (b) provide information on the thickness of ice required to support moving and stationary loads;
  - (c) specify methods for determining ice thickness and quality; and
  - (d) outline approved methods for the preparation and maintenance of ice bridges.

## CHAPTER 2

### Properties of Ice Covers

#### 2.1 Ice Formation

- 2.1.1 Ice forms on fresh water when the surface temperature falls to zero degrees Celsius, or at lower temperatures if dissolved impurities are present. While the underside of the ice cover in contact with the water will remain close to the melting temperature, the upper surface will be nearer to the surrounding air temperature.
- 2.1.2 The date of annual freeze-up, the rate of ice growth, and the quality of the ice cover depend on various factors such as air temperature, solar radiation, wind speed, snow cover, wave action, currents, and the size and depth of the water body. Generally, small lakes and slow-moving streams freeze over earlier than larger lakes of fast-moving streams.
- 2.1.3 While there are many different types of ice, the two types of major concern are:
  - (a) clear ice - formed by the freezing of water;
  - (b) snow ice - formed when water-saturated snow freezes on top of ice, making an opaque white ice which is not as strong as clear ice.

#### 2.2. Ice Colour

- 2.2.1 The colour of ice, which may range from blue to white to grey, provides an indication of its quality and strength:
  - (a) clear blue ice is generally the strongest;
  - (b) white opaque ice (snow ice) has a relatively high air content, and its strength depends on the density: the lower the density the weaker the ice; but high density white ice has a strength approaching that of clear blue ice;
  - (c) grey ice generally indicates the presence of water as a result of thawing, and must be considered highly suspect as a load-bearing surface.

#### 2.3 Ice Thickness

- 2.3.1 The other major factor determining the bearing capability of ice is its thickness. Care must be taken when determining the thickness of ice covers to ensure that the readings are properly taken and are an accurate representation of the area under consideration.

- 2.3.2 Currents have a distinct bearing on the temperature required to form ice. Rivers and channels with strong currents may remain open all winter despite low air temperatures. Springs can cause currents, and also be the source of warmer water; currents can also cause variations in ice thickness without changing the uniform surface characteristics.
- 2.3.3 When selecting the site of an ice bridge, currents and springs should be located and avoided. Frequent checks of the ice thickness should be made in areas suspected of being affected by currents.
- 2.3.4 Ice under an insulating snow blanket thickens very slowly even in low temperatures. A heavy snow cover, before significant ice growth, may cause the ice to remain unsafe throughout the winter.

## CHAPTER 3

### Bearing Capability of Ice

#### 3.1 General

- 3.1.1 The load-bearing capacity of ice covers depends on the quality of ice, its thickness, ice and air temperatures, temperature changes and solar radiation.
- 3.1.2 Clear blue ice is the standard of quality against which other types of ice are compared. White opaque ice, or snow ice, is normally considered to be only half as strong.
- 3.1.3 Ice covers may consist of alternate layers of clear ice and snow ice, and each layer should be measured so that the effective thickness may be calculated. For example, an ice cover with a total thickness of 8 inches (20 cm) consisting of a 4-inch (10 cm) layer of snow ice would have an effective thickness of 6 inches (15 cm).
- 3.1.4 The strength of ice is generally increased by low temperatures. The increase is progressive from zero to minus eighteen degrees Celsius and remains fairly constant below this point. However, a marked drop in temperature can temporarily cause internal stress in an ice cover and reduce its bearing capacity. This can often occur during overnight periods when the temperature is much lower than the preceding average for the day.
- 3.1.5 The removal of snow from an ice cover during periods of low temperature has an effect similar to a marked temperature drop. The bearing capacity of ice should be considered to be reduced by 50 per cent for 24 hours after these conditions.

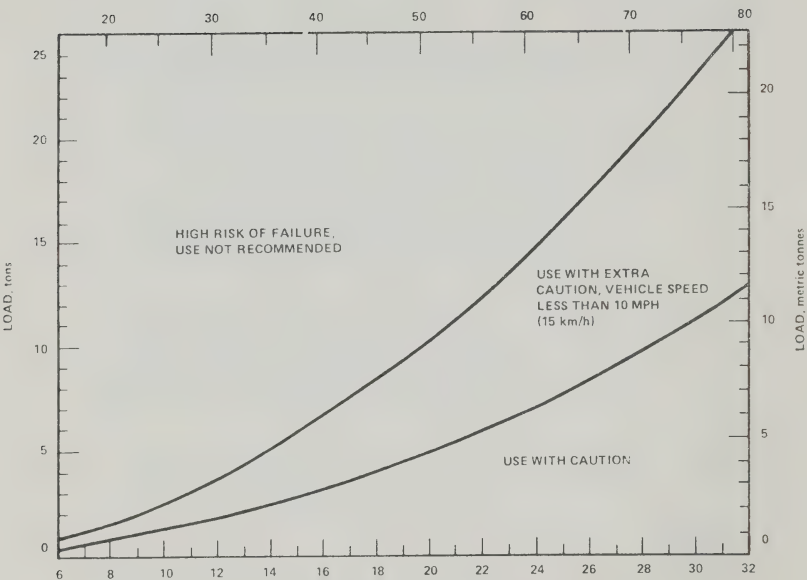
#### 3.2 Determining Ice Thickness

- 3.2.1 Prior to use, the ice should be measured to determine whether its effective thickness is adequate to support the expected load. The graph presented in Figure 1 should be used as a guide to the required thickness for the loads involved.
- 3.2.2 To initially determine effective ice thickness, the rule of thumb "one inch (2.5 cm) of clear blue ice for every thousand pounds (450 kg)" may be used.

#### CAUTION

Ice that is less than six inches (15 cm) thick should not be used for any crossing. Because of natural variations, thickness may be less than 2 inches (5 cm) in some areas.

THICKNESS OF GOOD QUALITY FRESHWATER ICE, cm



THICKNESS OF GOOD QUALITY FRESHWATER ICE, inches

The allowable load should be reduced by one half  
for operations on white opaque ice.

RECOMMENDED BEARING CAPACITY BASED ON EXPERIENCE

FIGURE 1



- 3.2.3 The effective thickness can vary considerably in an ice cover. In particular, dangerously thin areas can occur due to currents in the covers of rivers and estuaries, and on lakes near the inlet or outlet of rivers and streams. Careful attention should be given to reduced ice thickness close to shorelines and around ridges and leads.
- 3.2.4 The thickness can be determined by drilling test holes spaced at a maximum of 50 feet (15 m) apart in rivers, and 100 feet (30 m) apart on a lake.
- 3.2.5 Crossings should be checked for ice thickness once a week when average air temperatures vary between -15 and -5 degrees Celsius; and daily when the temperature is above -5 degrees Celsius. Checks can be less frequent when ice thickness substantially exceeds requirements. A new hole should be drilled for each ice measurement.
- 3.2.6 Ice that is no longer supported by water, due to lowering water levels, may be too weak to support the loads to be applied; conversely, a rising water level can result in the formation of two ice layers with an intervening water layer. Ice thickness tests will reveal these conditions.

### 3.3 Parked and Stationary Loads

- 3.3.1 Ice behaves elastically under moving loads; that is, the ice is depressed while loaded but recovers its original position after the load has passed.
- 3.3.2 With a stationary load the ice surface will sag continuously and may fail, depending on the strength of the ice cover. The safe bearing capability for stationary loads should be considered to be 50 per cent less than that for moving loads.
- 3.3.3 The sequence of failure for stationary loads is as follows:
  - (a) radiating cracks form at the bottom of the cover immediately beneath the load (and ultimately propagate through the cover);
  - (b) circular cracks form at the upper surface of the cover at some distance from the load (noticeable sagging of the ice may occur);
  - (c) the ice shears in a circle immediately adjacent to the loaded surface (failure may be imminent).
- 3.3.4 The initial radial cracks may not be of immediate concern if the load-bearing capacity of the ice is substantially higher than the load. However, prolonged application of the load should cause concern about possible ice failure.

3.3.5 Stationary loads should be moved under any of the following conditions:

- (a) when radial cracks develop;
- (b) if noticeable sagging is observed;
- (c) if the rate of sagging increases;
- (d) if continuous cracking is heard or observed;
- (e) if water appears on the surface of the cover.

3.3.6 The accumulation of drifted snow, often caused by stationary loads, may mask the indicators listed in paragraph 3.3.5 as well as increase the static load on the ice. Vehicles should be parked at least 5 lengths apart and in such a way that snow drifts do not interfere with other vehicles.

### 3.4 Effects of Speed

3.4.1 When a vehicle travels over an ice cover, a hydrodynamic or resonance wave is set up in the underlying water. This wave travels at a speed that depends upon the depth of the water, the thickness of the cover and the degree of elasticity of the ice. If the speed of the vehicle coincides with that of the hydrodynamic wave, the stress on the cover due to the wave reinforces that due to the vehicle, and can increase the maximum stress in the ice to the point of failure. The wave action tends to crack the ice in a checkerboard pattern.

3.4.2 Particular care should be exercised when approaching or travelling close to shore, or over shallow water, because of more severe stressing of the cover due to reflection of the hydrodynamic wave. Roads and vehicle approaches should meet the shoreline at an angle of not less than 45 degrees.

3.4.3 If the weight of a loaded vehicle is one-half or less than that determined from Figure I as safe for the thickness of the ice being used, speed is not critical. When the weight is greater, and for ice thickness less than 30 inches (75 cm), speed should be carefully controlled and in general be kept below 10 mph (15 km/h).

### 3.5 Cracks

3.5.1 The ice usually has many cracks made by thermal contraction or movements of the ice cover. Except at the thaw period cracks do not necessarily indicate a reduction in the load-bearing capability of the cover.

- 3.5.2 A dry crack with an opening of less than 1/8 inch (0.32 cm), which does not penetrate very deeply into the ice cover, will not cause serious weakening. Where a single dry crack in excess of one inch (2.5 cm) is noted, loads should be reduced by one third; for intersecting cracks of this size the loads should be reduced by two thirds. Dry cracks should be repaired by filling with water or slush.
- 3.5.3 A wet crack indicates that the crack penetrates completely through the ice cover and therefore affects the load-bearing capacity, which should be reduced by one half in the case of a single wet crack. If two wet cracks meet at right angles the reduction is to one quarter of that for a good cover. Most wet cracks refreeze as strong as the original ice cover; however a core sample should be taken to ascertain the depth of healing.
- 3.5.4 Due to normal thermal contraction, cracks sometimes form at the middle of a road in the direction of travel; but these do not seriously reduce the bearing capability if they remain dry. If cracks form parallel to the road, at the sides, they do indicate over-stressing (perhaps by snow deposits from clearing operations) and possible fatigue due to excessive traffic. If such cracks develop, particularly if they are wet, road use should cease at once, and not be recommenced until the cracks are healed.
- 3.5.5 Fluctuating water levels may produce cracks near and generally parallel to the shoreline. These cracks are often accompanied by a difference in the levels of the floating and the grounded ice. If these cracks are wet, loads should be reduced accordingly. With extreme level differences, appropriate bridging repair (flooding, reinforcing) may be necessary.

### 3.6 Spring Thaw

- 3.6.1 Ice covers will begin to decay in the spring as the ice warms and begins to melt. The ice will thaw in the sunlight, but in the early spring may refreeze at night. Intensive thawing begins only in atmospheric temperatures above freezing.
- 3.6.2 Snow is a poorer thermal conductor than ice. A covering of 3 to 4 inches (7.5 to 10 cm) of clean snow on an ice bridge will reduce significantly the solar radiation penetrating the cover, thus prolonging the period of use.
- 3.6.3 Travel over an ice bridge displaying water on the surface should be executed with great caution and only if absolutely necessary. If mild weather continues and the water disappears, it may indicate that the ice is honey-combed, in which case the use of the area as an ice bridge should be discontinued immediately.

## CHAPTER 4

### Preparation of Ice Bridges

#### 4.1 Building Techniques

- 4.1.1 A marked route over a natural ice cover can be utilized as an ice bridge, but since this may not provide sufficient strength for repetitive use, various techniques may be used to increase the safe load-bearing capability.
- 4.1.2 When temperatures are low and early winter use is not required, ice thickness can be increased by keeping the intended crossing snow-free, or by compacting the snow so that its normal insulating qualities are diminished. The natural rate of ice growth will thus be accelerated and the required thickness will eventually be reached.
- 4.1.3 If there is a need for a bridge when temperatures are not low enough to obtain the necessary natural thickness by the time of required use, the ice thickness can be increased by flooding: adding water on top of the existing ice cover.

#### 4.2 Flooding

- 4.2.1 The flooding operation is normally carried out with small lightweight pumps, rather than larger pumps which are less portable.
- 4.2.2 Flooding may be started as soon as the natural ice is about 3 inches (7.5 cm) thick and strong enough to bear the weight of persons and pumps. The initial flooding should be limited to a depth of about one inch (2.5 cm).
- 4.2.3 Subsequent floodings or "lifts" should be limited to that depth of water that will freeze within 12 hours. As a rule of thumb, an average air temperature of -18 degrees Celsius will freeze 2 inches (5 cm) of water overnight. With average temperatures of -31 degrees Celsius or lower, lifts may be increased to 3½ inches (9 cm). Wind or snow on the surface will increase or decrease the freezing rate respectively.
- 4.2.4 Thicker lifts can lead to a layer of water between the old ice surface and the new layer of ice. When covered by succeeding lifts of warm water, this layer may not freeze until well after the bridge has been completed. Such lifts may also overload and crack the existing ice cover.

- 4.2.5 To achieve maximum strength in the bridge, any snow cover should, if possible, be removed before each flooding operation. However, dragging or packing the snow to an even thickness and then flooding--"slushing"--provides a thicker sheet in less time but the resulting ice is not as strong.
- 4.2.6 If banks of snow are constructed on each side of the bridge to contain the flooding, they should be at least 150 feet (45 metres) apart; however, a 200-foot-wide (60 metre) bridge is preferable.
- 4.2.7 Snow banks may leak after freezing has begun so that a crust of ice is formed with an air-filled void between it and the initial ice cover.
- 4.2.8 Flooding should take place from the bridge centre line, letting the water feather out to seek its own level. This method also provides a wider bridge surface.
- 4.2.9 Ice formed by the flooding process will be stress-free if each lift is allowed to become completely frozen before the next flooding.

#### 4.3 Reinforcement

- 4.3.1 An ice bridge built in more temperate climates or intended for repeated use may be reinforced with grasses, brush or logs. Such a bridge can then take a greater load for the same thickness, being held together by the reinforcing inclusions. It can heal itself more easily after cracking and is less likely to fail catastrophically.
- 4.3.2 One disadvantage to reinforcement is the added time and effort required for construction. Another is the effect of local radiational heating of the reinforcing inclusions, particularly during the spring thaw, which will increase the rate of decay of the bridge.
- 4.3.3 It is preferable to locate the reinforcing items in the bottom portion of the final ice bridge; they should be placed and frozen in as early as possible.
- 4.3.4 Reinforcing logs, properly placed in an ice bridge, will make possible a reduction of ice thickness of up to 25 per cent.

#### 4.4 Maintenance

- 4.4. On completion, the following rules should be observed in order to increase the safety and life of the ice bridge:

- (a) The bridge must be kept clear of excessive snow, and the snow banks kept well back, with slopes of no more than a ratio of 1 to 5. The weight of snow banks can weaken the ice underneath and form relatively deep ditches by slow sagging, and therefore should be levelled out if higher than 3 feet (1 metre) or two thirds of the ice thickness, whichever is the larger.
- (b) A covering of 3 to 4 inches (7.5 to 10 cm) of compacted snow will give good traction and will also provide a cushion. Glare or snow-free ice breaks up rapidly under traffic in extreme cold.
- (c) The surface should be kept clear of dirt or other dark material, such as oil spots, which will absorb solar radiation and melt into the ice. Puddles of water also absorb heat from the sun and should be "repaired" by filling with snow.
- (d) The ice bridge should be checked for cracks daily and on foot, and its thickness measured as outlined in article 3.2. A longitudinal crack more or less down the centre line may occur, particularly if the ice thickness has been increased by flooding. If dry, this crack is not serious. Wet cracks should be repaired immediately and loads reduced until the re-freezing process is completed (see article 3.5).

#### 4.5 Operating Precautions

- 4.5.1 Following are a number of general precautions which should be taken when testing for ice thickness or crossing ice covers:
- (a) All persons involved in operations over ice covers should be familiar with the hazards involved, the precautions to be taken and the basic rescue techniques required in case of a breakthrough.
  - (b) Single persons or single vehicles should not venture onto an ice cover when there is no help at hand.
  - (c) When testing, persons on foot should carry long poles, to be used as an aid to rescue in case of breakthrough, or alternatively be securely roped together, with minimum spacing of 50 feet (15 m).
  - (d) Light vehicles used during test periods and initial build-up should be equipped with an extended frame of logs to provide support if the vehicles break through the ice cover.

- (e) A rope at least 50 feet (15 m) long, or equivalent to water depth, with a float, may be attached to test vehicles as an aid to marking and recovery.
- (f) Vehicle doors and cab hatches should be removed or lashed open; seat belts must NOT be worn.
- (g) Adequate spacing must be maintained between vehicles; it is recommended that an interval of at least 100 feet (30 m) be observed.
- (h) Vehicle speed should not normally exceed 10 mph (15 km/h) in order to avoid the effects of the hydrodynamic wave, nor should speed be less than 1 mph (1.5 km/h) in order to avoid the effects of a stationary load.
- (i) Where practicable, precautionary and speed limit signs should be erected at each end of the ice bridge, and the route across the ice cover clearly marked.
- (j) Traffic lanes should alternate across the width of the ice bridge, working gradually from one side to the other before starting over again. This reduces the danger of deterioration of the ice and makes possible a choice of routes if dangerously cracked areas develop or breakthrough occurs.
- (k) Equipment required for rescue operations, such as "mats" (chained or wire-linked small logs or heavy planks as a platform for rescue vehicles) jacks, hoists, etc., should be available near by.
- (l) Frequently it is the second vehicle in a convoy which encounters ice failure problems. Before a second heavily loaded vehicle proceeds along the ice bridge, it is advisable to have it preceded by a more lightly loaded vehicle to check the route.
- (m) For a period of 24 hours after a marked drop in temperature, or following the removal of snow from the ice cover during periods of low temperature, loads should be reduced by 50 per cent and night-time travel should be discouraged.

## CHAPTER 5

### The Use of Snowmobiles on Ice Covers

#### 5.1 General

- 5.1.1 Drownings resulting from snowmobiles going through ice are the greatest single cause of fatalities arising out of the use of these machines. However, snowmobile operations over ice covers can be conducted safely by using common sense and observing the basic precautions.
- 5.1.2 As the total load - machine, operator and ancillary gear - may weigh approximately 500 pounds (225 kg) or more, a substantial thickness of ice is required for support.
- 5.1.3 Difficulties in control, steering and stopping are increased on snow-free ice, particularly at higher speeds.

#### 5.2 Operating Precautions

5.2.1 The following is an outline of some of the basic precautions:

- (a) Where there is an alternative, single machines should not be operated unaccompanied over ice covers.
- (b) Should single machine operation be unavoidable, the shore base should be notified of the route to be taken, the destination and probable time of return.
- (c) Operations should not be conducted over ice covers less than 6 inches (15 cm) thick.
- (d) Operators should know of and avoid locations where currents or springs may cause dangerous thinning of the ice cover.
- (e) Fog may indicate the proximity of open water; speed should be reduced and great care taken.
- (f) When unexpectedly encountering open water normal action is to slow down, brake gently and turn away; otherwise, turn as sharply as possible. If a turn cannot be made in time or a skid results, the operator should roll off the machine.
- (g) Glare from the sun and ice may obscure obstacles or dangerous areas; anti-glare sun glasses should be worn under these conditions.



- (h) Operations at night or at high speeds should be restricted to well-marked and known safe trails or crossings.
- (i) Unless essential, snowmobiles should not be operated on ice bridges or roads with other types of traffic.
- (j) Avoid operating over slush or water-covered ice; but if unavoidable, ensure that the tracks are cleared of ice and slush.

## References

Additional technical information concerning ice formation and its use is available in the following publications:

Publication CLI-7-71

"Freeze-up and Break-up Dates of  
Water Bodies in Canada"

Information Section

Central Service Directorate

Atmospheric Environment Services

Environment Canada

Technical Memorandum No. 56

"The Bearing Strength of Ice"

National Research Council

Research Paper No. 469, NRRCC 11806

"Use of Ice Covers for Transportation"

National Research Council

Information and advice may be obtained also from the "National Research Council of Canada, Division of Building Research, Geotechnical Section, Ottawa, Ontario, K1A 0R6".

SAFETY GUIDE FOR  
FIELD OPERATIONS

TB GUIDE 5-4

## FOREWORD

A wide range of activities, environmental conditions and hazards are common to field operations, requiring special care and attention on the part of those involved directly, and on the part of supervisory staffs responsible for the control of such operations.

This guide has been prepared accordingly, to focus attention on some major areas of concern, and to serve as a basis for the development of more detailed departmental safety rules and procedures. Particular note should be made of action to be taken before personnel are dispatched on any field operation: thorough planning and careful preparation are essential to the continued safety and good health of those involved.

## Purpose

1. Field operations, particularly those undertaken in isolated areas, expose personnel to a wide range of unique occupational risks and hazards. The purpose of this Guide, therefore, is to provide an outline of basic occupational health and safety practices and procedures which may be applied and further developed as required by departments.

## Application

2. This Guide applies to all Public Service departments and agencies, as defined in Part I of Schedule I of the Public Service Staff Relations Act.

## Definitions

3. In this Guide
  - (1) "field officer" means a party chief or other officer to whom, during field operations, is delegated the responsibility to manage a project, or a part thereof;
  - (2) "field operations" means those operations and activities conducted by individuals or groups of persons away from the department's premises, such as surveys of an engineering and research nature, forest fire fighting, rescue operations or work parties.

## General

4. Departments undertaking field operations should, based on the general requirements of this Guide, issue detailed safety directives governing the conduct of field operations, appropriate to the particular risks and hazards which may be foreseen. In this regard, the following general practices are recommended:
  - (1) one member of each field party (normally the field officer in charge) should be appointed as a safety officer;
  - (2) where a safety officer is not the field officer in charge, a clear definition of the safety officer's authority and responsibility should be provided;
  - (3) an appropriate official or authority in the area should be advised of the geographical location of an isolated field operation, its estimated duration, the normal and emergency methods of communication, and the names or the number of personnel in the party. Provincial Forest Services should be advised as a courtesy;
  - (4) all relevant safety and health standards applicable to the Public Service should be reviewed prior to departure (see paragraph 31 for list);

- (5) inexperienced personnel who will be working in isolated areas should be provided, where required, with basic survival training or information.
5. Members of the field party should be briefed by the designated safety officer on the basic safety and health rules to be observed according to the type of field operation and the expected environment, including the following:
  - (1) the location of the nearest available emergency medical facility, police station, military or forestry establishment;
  - (2) the procedures to be followed in the event personnel become lost, or in the evacuation of seriously ill or injured personnel;
  - (3) the location and method of operating of any emergency equipment provided or available in the area;
  - (4) the procedure to be followed for carrying out regular field operation reviews for the purpose of identifying and eliminating unsafe and unhealthy conditions and practices; and
  - (5) procedures to be followed in the event of encounters with wildlife, particularly bears.

#### Equipment

6. Departments should ensure that all field and safety equipment is checked for suitability and serviceability prior to issue, and re-checked by field and/or safety officers on receipt. Personnel should be instructed on the proper use, care and maintenance of field and safety equipment.

#### Boat and Water Safety

7. Comprehensive safety guidelines, embodied in the Transport Canada publication "Boating Safety Guide" concerning the use of boats, both powered and unpowered, should be followed. The wearing of approved-type life jackets should be enforced in accordance with the provisions of the Personal Protective Equipment Safety Standard, TB STD 3-14.

#### Snowmobiles

8. Safety rules concerning the operation of snowmobiles, such as those outlined in the booklet "Play Safe with Snowmobiles" (available from the Canada Safety Council), should be followed. In addition, snowmobiles should be operated in compliance with local regulations governing their use. Additional safe operating procedures are contained in the Safety Guide for Operations Over Ice, TB GUIDE 5-3.

### Motor Vehicles and Trailers

9. Departmental safety rules and procedures concerning the operation and use of government-owned or leased motor vehicles and trailers, encompassing the applicable requirements of the Motor Vehicle Operations Safety Standard, TB STD 3-11, should be developed and enforced.

### Diving Operations

10. Personnel performing diving duties should be physically and mentally fit to perform each task, and be in possession of a valid certificate of qualification satisfactory to the department.

### Sanitation and Hygiene

11. The field officer in charge should ensure, as far as is practicable, that personnel involved in the preparation and serving of food are free from any communicable disease, and that sanitation and shelter facilities are maintained in a manner that does not constitute a health or ecological hazard.

### Vehicle Traffic Hazards

12. All field operation crews exposed to hazards from vehicular traffic should wear a high-visibility vest or other similar clothing, and use appropriate warning signs or be protected by a high-visibility barricade in accordance with the Personal Protective Equipment Safety Standard, TB STD 3-14.

### Tent Heaters, Gasoline Stoves and Lanterns

13. All heaters, gasoline stoves and lanterns should be carefully fuelled and lighted, and care should be taken to keep all open-flame models away from combustible materials. During the use of such equipment in tents, shelters, or any confined enclosure, adequate ventilation should be assured to eliminate the possibility of carbon monoxide poisoning or oxygen deficiency.

### Firearms

14. No person should be allowed to handle or use a firearm unless the department is satisfied as to that person's sense of responsibility, competence and demonstrated knowledge of accepted safety practices in the use of firearms.

### Use of Explosives

15. Good industrial safety practices and departmental regulations, where applicable, should be followed with respect to the handling, preparation or firing of explosive charges. Information in this regard is available from Labour Canada in Technical Data Sheet "The Safe Use of Explosives in Federal Enterprises". The "Explosives Act of Canada" should also be observed.

## Fire Prevention and Fire Fighting

16. Basic fire-fighting rules and procedures should be developed and enforced for specific field operations consistent with the general requirements and standards prescribed by the Dominion Fire Commissioner. Provincial forestry requirements should be observed where applicable. Fire fighting should be controlled by experienced crew leaders, and appropriate safety clothing and footwear worn.

## Air Transport Operations

17. The safety of personnel travelling by air is a prime consideration when making arrangements for transport by charter aircraft. Departments should conclude contracts only with those air carriers who have demonstrated compliance with Transport Canada standards relating to air carriers. These standards are found in the Air Navigation Orders (ANOs) available from Supply and Services Canada, which contain safety-related regulations; designated safety officers should carefully review the following ANOs, as appropriate, before the operation begins:
  - (1) ANO VII, 3 - Standards and Procedures for Air Carriers Using Small Airplanes in Air Transport Operations.
  - (2) ANO VII, 2 - Standards and Procedures for Air Carriers Using Large Airplanes in Air Transport Operations.
  - (3) ANO VII, 6 - Standards and Procedures for Air Carriers Using Rotocraft in Air Transport Operations.
18. Non-compliance with these safety procedures, or any other unsafe practices or conditions, should be reported to Transport Canada, ASP, Transport Canada Building, Ottawa, K1A 0N8.
19. Emergency Equipment and Exits. A seatbelt is required for every passenger. The seatbelt shall be secured during takeoff and landing and whenever considered necessary by the flight crew. Each passenger seat shall be provided with printed information listing the emergency equipment carried, and the location and operation of emergency exits. The emergency equipment and ratings detailed in ANO V, 12, shall be carried on all flights conducted within the "sparsely settled area" which is defined in the Order. There should be a readily-accessible lifejacket or flotation device for each person on board a floatplane, and the location of these made known to the passengers by the pilot or aircrew.
20. Personal Clothing. The probable temperature in the area of the flight should be known, and appropriate footwear (not street oxfords) and clothing worn or carried, including clothing to protect against insects in summer months.



21. Emergency Locator Transmitter (ELT). All aircraft are required to carry a compact radio, which transmits a distinctive signal on the emergency frequency of 121.5 mHz for the detection and location of downed aircraft. It will normally be triggered "on" automatically during a forced landing. If the ELT is not automatically triggered, it can be turned on manually. The battery life of an ELT is at least 100 hours, and signals can be heard up to 100 miles (160 km) away by high-flying aircraft. The ELT provides a homing signal to pinpoint location and greatly reduces time-to-rescue.
22. Information on the location and operation of the ELT is placarded in the cabin, and its location is marked externally on the aircraft. It is usually mounted behind the cabin or to the rear of the aircraft. Before boarding the aircraft the crew should describe the location and operation of the ELT.
23. More information on the ELT and the search and rescue system is in a colour slide/sound presentation available on loan from any Regional Office of Transport Canada.
24. Flightplans. The purpose of the flightplan is to ensure that a record is available if an emergency develops. For every flight, a flightplan form should be filed by the pilot through the company (or an agent) for transmission to air traffic control. If this is not possible, the pilot is required to notify a responsible person of his proposed flight by means of a flight notification or flight itinerary. This should specify the estimated duration of the flight or series of flights, the estimated time of return, the route or the area boundaries of the flight operation, and the location of any overnight stops.
25. The pilot is responsible for the safe conduct of the flight, and should not be unnecessarily distracted from the task of flying. Passengers should not request changes from the flightplan for personal reasons such as sightseeing, photography, low flying, etc.
26. Weather. It is the pilot's responsibility to determine if weather conditions are suitable for a safe flight, and passengers should not attempt to influence the pilot's decision in this regard. Normally, safe visual flight, i.e. flight with visual reference to the ground, requires a 1000-ft (300m) cloud ceiling and 3 miles (4.8 km) forward visibility. However, minimum requirements permit flight with a 700-ft (210m) cloud ceiling and 1 mile (1.6 km) forward visibility. If weather falls below these limits, visual flight must be discontinued. Visual flight above a cloud layer is not permitted.
27. Cargo. Personal baggage and equipment should be properly secured. When cargo is carried in the cabin with passengers, it should be secured by nets, strapping or other tiedown to prevent shifting in flight. Cargo should not be placed so as to restrict the use of emergency or regular exits. It is the pilot's responsibility not to exceed the aircraft's total "maximum gross weight", and to ensure that the load is distributed

so that the aircraft is within its centre of gravity limits. Passengers carrying their own baggage and equipment should ask the pilot where it is to be placed; the pilot should not be pressed to put on extra items that might overload the aircraft.

28. **Propellers and Rotors.** Every year rotating propellers and rotors cause fatal and serious injuries because they are difficult to see when in motion. Passengers should not board, leave or work around aircraft when propellers or rotors are in motion. The helicopter is often an exception to this rule, when rotors must be kept in motion at remote landing sites. Passengers should receive a thorough briefing from the pilot or crew member before boarding or leaving a running helicopter. Most accidents occur when persons walk into the tail rotor. The safe procedure is to crouch low and approach or depart the helicopter from the side or the front but never near the tail rotor area. Never walk downslope toward the helicopter and never walk upslope away from the helicopter.
29. A passenger should not normally perform any crew function unless safety is otherwise in jeopardy. In any case, a passenger must receive a thorough briefing, including safety procedures, from the pilot or flight crew member. An inexperienced floatplane passenger attempting to assist the pilot to dock exposes himself to extreme danger from the rotating propeller. Passengers have been struck by propellers while walking forward to the front end of the float to tie the aircraft to a dock or mooring point. After docking, twin-engine floatplanes create a hazard to persons when rotating propellers overhang the dock. Passengers should not disembark from these aircraft until the propellers are stopped.
30. Additional safety information is given in a colour slide/sound presentation entitled "Safety Around Small Aircraft", available from any Regional Office of Labour Canada.

#### Other References

31. In addition to other applicable safety standards, procedures and guides approved by the Treasury Board for the Public Service, the following specific documents should be reviewed in conjunction with this Guide, and applied as appropriate:
  - (1) First Aid Standard, TB STD 3-5.
  - (2) Hand Tools and Portable Power Tools Safety Standard, TB STD 3-6.
  - (3) Personal Protective Equipment Safety Standard, TB STD 3-14.
  - (4) Motor Vehicle Operations Safety Standard, TB STD 3-11.
  - (5) Periodic Health Evaluations Standard, TB STD 3-13.
  - (6) Safety Guide for Operations Over Ice, TB Guide 5-3.



